Devolinx®

# Serial-Ethernet Server

# STE-601C

# User's Manual

Version 1.3

aaxeon®
AAXEON TECHNOLOGIES, INC.
www.aaxeon.com

## IMPORTANT ANNOUNCEMENT

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This document is intended to provide customers with brief descriptions on the product and to assist customers to get started. For detail information and operations of the product, please refer to this manual or the CD attached.

# FCC WARNING

## Class A for Ethernet Serial Server

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expenses.

A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord can be used.

Use only shielded cables to connect the device's RS-232 or RS-485 port.

Be cautioned that changes or modifications not explicitly approved by Aaxeon Technologies could void your authority to operate the equipment.

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# 1. Introduction

The STE-601C Ethernet-Serial Server is a gateway between Ethernet (TCP/IP) and RS-232/RS-485 communications. The information transmitted by STE-601C is transparent to both host computers (Ethernet) and devices (RS-232/RS-485). Data coming from the Ethernet (TCP/IP) is sent to the designated RS-232/RS-485 port and data being received from RS-232/RS-485 port is sent to the Ethernet (TCP/IP) transparently.

In the computer integration manufacturing or industrial automation area, the STE-601C Ethernet-Serial Server is used for field devices to direct connect to Ethernet network. Terminal Server (main control program run in STE-601C) transforms whatever data received from RS-232/RS-485 to TCP/UDP port then connect devices to the Ethernet network via a single application program or multiple application programs.

Many control devices provide the ability to communicate with hosts through RS-232/RS-485 however RS-232/RS-485 serial communication has its limitations. For one, it is hard to transfer data through a long distance. With STE-601C, it is possible to communicate with a remote device in the Intranet environment or even in the Internet and thus, increases the communication distance dramatically.

STE-601C from Aaxeon Technologies, Inc. offers one RS-232/ RS-485 port, one RJ45 Ethernet and Watch-Dog Timer etc.

## 1.1 Packaging

STE-601C Ethernet-Serial Server x 1

STE-601C Ethernet-Serial Server quick start guide x 1

Mini DIN to RS-232 DB-9 Cable x 1

Wall mount x 2

Product CD containing configuration utility and sample programs x 1

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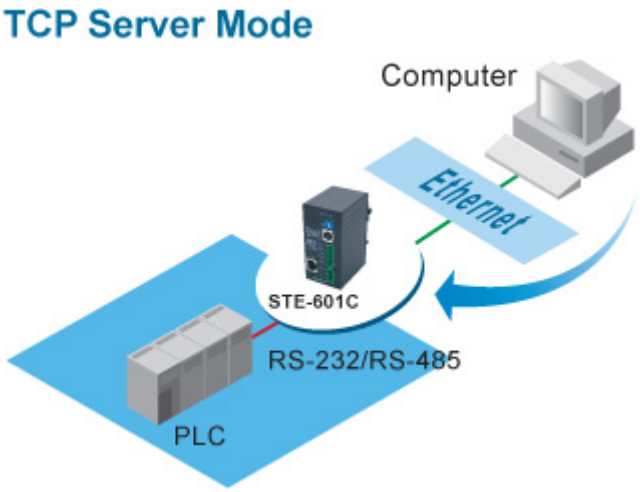
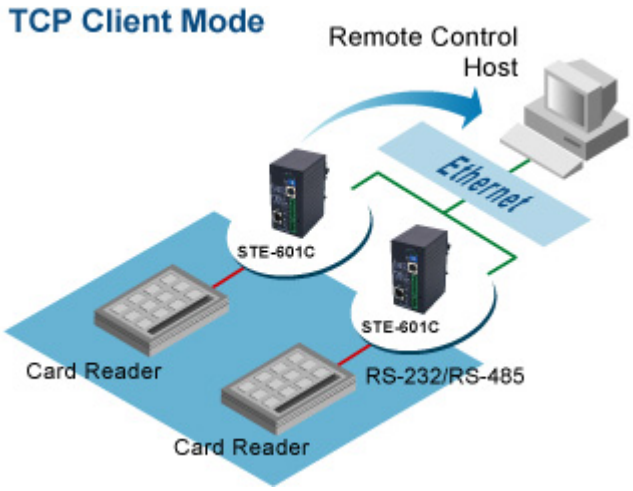
## 1. 2 Application Connectivity

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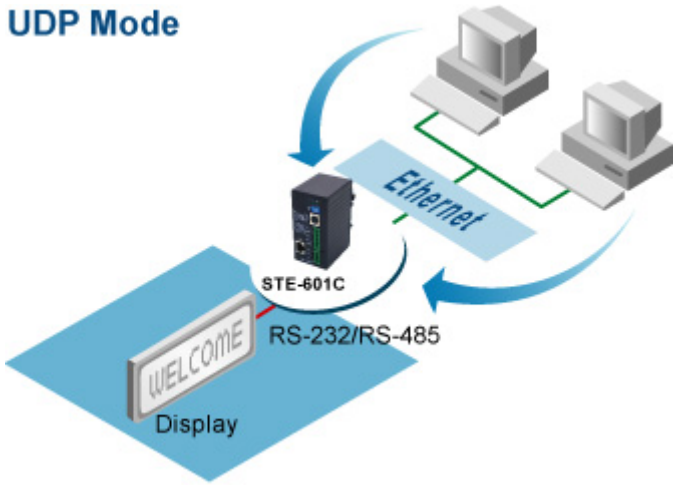


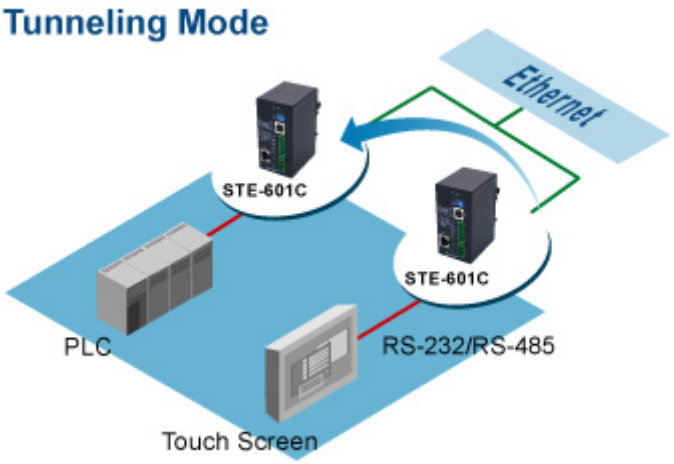


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# 2. Nomenclature and Settings

## 2.1 Nomenclature of STE-601C Components

Figure 2.1 shows the names of STE-601C components. In the figure, the indicated switch settings represent factory settings.

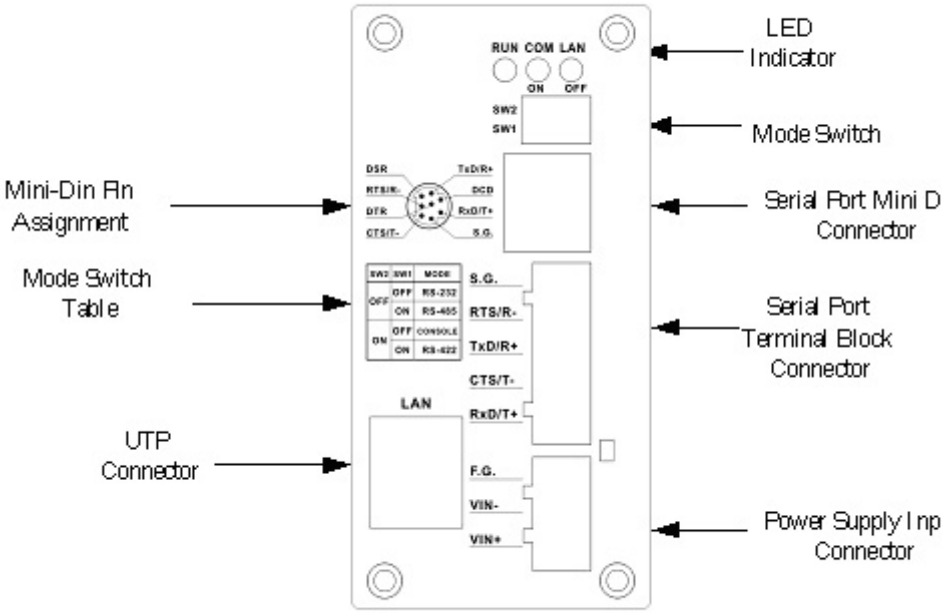


Figure 2.1. Nomenclature of STE-601C components.

## 2.2 MODE Switch

This sets or initializes the operating mode for the STE-601C. The factory default setting is that Switch 1 (SW1) and Switch 2 (SW2) are set to OFF. You can use the Mode switch to change the operating mode from the factory default settings to your desired mode.

STE-601C can be setup either RS-232, RS-485, RS-422 or Console configuration mode by MODE Switch.

| SW1 | SW2 | Mode |
|---|---|---|
| OFF | OFF | RS-232 |
| | ON | CONSOLE |
| ON | OFF | RS-485 |
| | ON | RS-422 |

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# 3. Hardware Installation

- Prepare necessary cables, hub, power cord and RS232/RS485 connector.
- Connect STE-601C to Ethernet network via hub/switch or direct connect to host computer through cross over cable.
- Connect a serial device to a serial port of STE-601C, make sure the right connection of either RS-232 or RS-485.
- Plug in DC9-30V, the buzzer will beep and the RUN LED will blink if STE-601C functions normally. Please refer to Appendix A.4 to see all of LED messages.
- Use **monitor.exe** configuration utility in the product CD or diskette to diagnose STE-601C. If it starts up successfully, you are able to find the IP and MAC addresses of STE-601C. You can change the network parameters of STE-601C to join your LAN by changing its IP address, gateway IP address and subnet mask.

## 3.1 Configuration

STE-601C Ethernet-Serial Server is shipped with default settings shown in the following table:

| Property | Default Value |
|---|---|
| IP Address | 10.0.50.100 |
| Gateway | 10.0.0.254 |
| Subnet Mask | 255.255.0.0 |
| User Name | admin |
| Password | Null |
| COM 1 | 9600,None, 8, 1, No flow control, buffer disabled, packet delimiter timer 2ms |
| Link 1 | Type: TCP Server, Listen port 4660, Filter=0.0.0.0, Virtual COM disabled |
| SysName of SNMP | name |
| SysLocation of SNMP | location |
| SysContact of SNMP | contact |

**Note:** Aaxeon provides a default button to restore system settings including IP address, gateway IP address and subnet mask etc. to the defaults. Press and hold the default button for 5 seconds till the server reboots.

## 3.2 Assigning a new IP Address by ARP command

ARP –s is used to assign a static IP address of STE-601C and add this static entries to the ARP cache of the computer, when TCP/IP packet with destination port number 1 is sent to STE-601C, it causes the device to check its MAC address with IP address, once STE-601C finds those two unmatched, it will reboot and change to the new IP address which was set by ARP –s command. The following example uses ARP to assign a static IP address of STE-601C using its MAC address printed on the label of the rear panel, then use Telnet to send the TCP/IP packet with destination port number 1 to STE-601C, after STE-601C reboots it will change its IP address to the new one.

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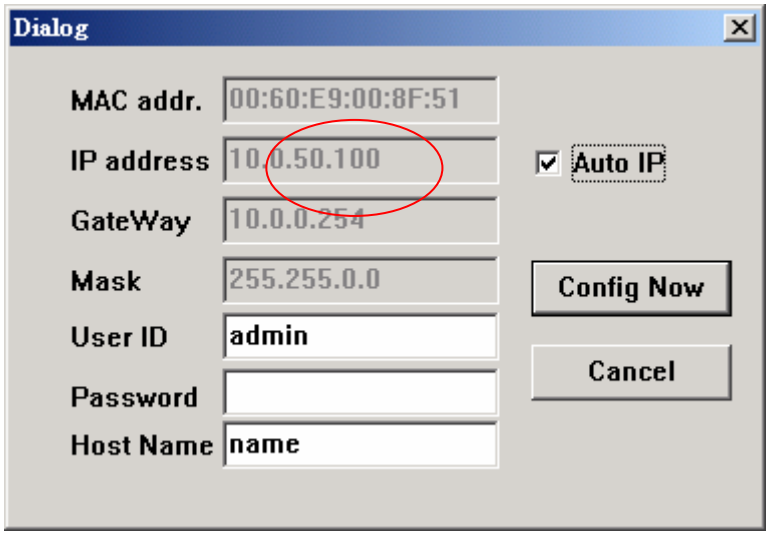
Command Prompt - telnet 10.0.50.101 1
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-1999 Microsoft Corp.
C:\>arp -s 10.0.50.101 00-60-e9-00-79-f8
C:\>arp -a
Interface: 10.0.154.223 on Interface 0x1000003
Internet Address Physical Address Type
10.0.50.101 00-60-e9-00-79-f8 static
C:\>telnet 10.0.50.101 1
Connecting To 10.0.50.101...

**Notes:**

1. Arp command can only be used to set a static IP address of STE-601C using system default user name admin and default password null.
2. Only TCP/IP packet with destination port number 1 will lead STE-601C to reboot and change the IP address.

## 3.3 Auto IP

A DHCP server automatically assigns the IP address and network settings. STE-601C supports DHCP. It will supply for the unit with an IP address gateway address, and subnet mask. You may use **Monitor.exe** software to search network information automatically by putting a check on **Auto IP** on Dialog window.

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## 3.4 TCP/IP Port Number

Port number 4660 is default of STE-601C and is associated with serial port COM1 respectively. After your application program connects to the TCP port 4660 of STE-601C, data being sent to this TCP connection from your application program are transparent to the COM1 of STE-601C. Vice versa is also true.

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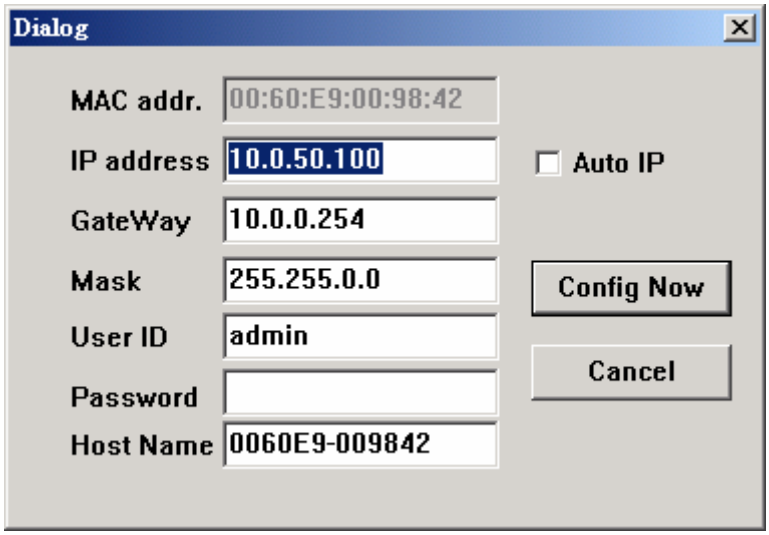
# 4. Software Configuration

## 4.1 Configuration set by monitor.exe utility

Use **monitor.exe** that comes with the product CD or diskette to configure the network parameters of STE-601C. As you can see from the following picture, you can change IP address, gateway IP address, subnet mask, user ID and password of STE-601C from the utility. For more details of the utility please refer to Appendix-D Configuration Utility.




## 4.2 Configuration set by Telnet utility

You can use Telnet utility to change configuration settings of STE-601C. To do so, please do the following.

**Log in to the system**

Telnet to 51C-$_{MAXI}$ using command "**Telnet IP_address**".

**For example Telnet 10.0.50.100**

1. After telnet to STE-601C, system prompts for a password, the default password is null.

**Note:** You can press the default button of STE-601C to reset the password to the default value.

2. After verifying the password, the following terminal screen appears.

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```
Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit  1.Overview  2.Networking  3.Security  4.Com1

Input choice and enter(0~4): 2

Networking:
IP
0.  DHCP (Disabled)
1.  IP Address (10.0.50.100)
2.  Gateway (10.0.0.254)
3.  Subnet Mask (255.255.0.0)

SNMP
4.  SNMP (Enable)
5.  SysName (name)
6.  SysLocation (location)
7.  SysContact (contact)


Input choice and enter(0~7):
```

**NOTE:**

1. If STE-601C does not receive any command within 1 **minute**, Telnet will be terminated automatically.
2. The changes of networking parameters will take effect only when you exit and restart STE-601C.
3. Select "1" from "Input choice and enter (0~4):" to enter overview page as following:

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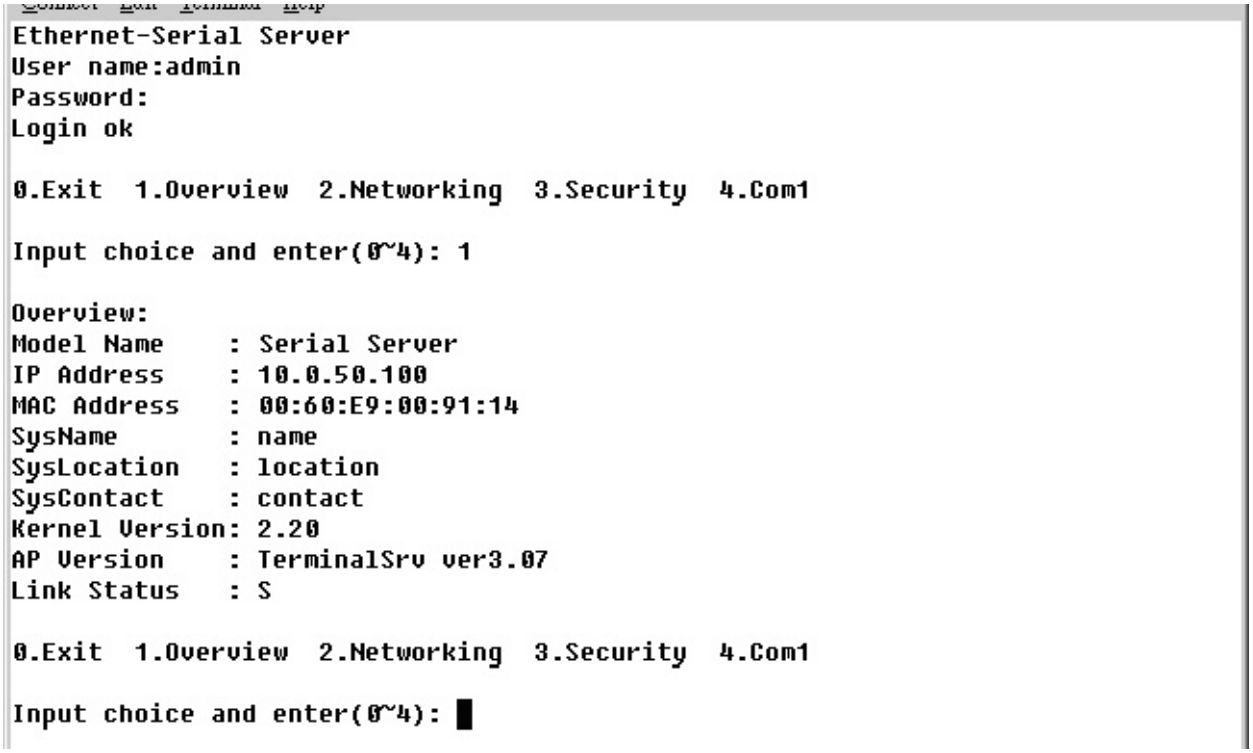


This page gives you the general information of STE-601C including IP and MAC address, SNMP information, kernel and AP version, and connection status of the device.

**Networking**

Select "2" from "Input choice and enter (0~4):" to enter Networking page as following:

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```
Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit  1.Overview  2.Networking  3.Security  4.Com1

Input choice and enter(0~4): 2

Networking:
IP
0.  DHCP (Disabled)
1.  IP Address (10.0.50.100)
2.  Gateway (10.0.0.254)
3.  Subnet Mask (255.255.0.0)

SNMP
4.  SNMP (Enable)
5.  SysName (name)
6.  SysLocation (location)
7.  SysContact (contact)


Input choice and enter(0~7):
```

This page allows you to change network settings of the device including IP address, subnet mask, gateway IP address and SNMP information of STE-601C. Please notice that any setting change made on this page won't take effect until you restart the device.

**Change the password**

1. Select "3" from "Input choice and enter (0~4):" the following screen appears.

```
Ethernet-Serial Server
User name:admin
Password:
Login ok


0.Exit  1.Overview  2.Networking  3.Security  4.Com1
Input choice and enter(0~4):3
Do you want to change the password?y/n?y
Please input old password:
Please input new password:*****
Please verify new password:*****
Password changed! Press enter to continue
```

2. If you want to change the password, please type the old password in the "Please input old password" field, type the new password in the "Please input new password" and the "Please verify new password" fields.

**Note:** You can press the default key of product to reset password to the default value.

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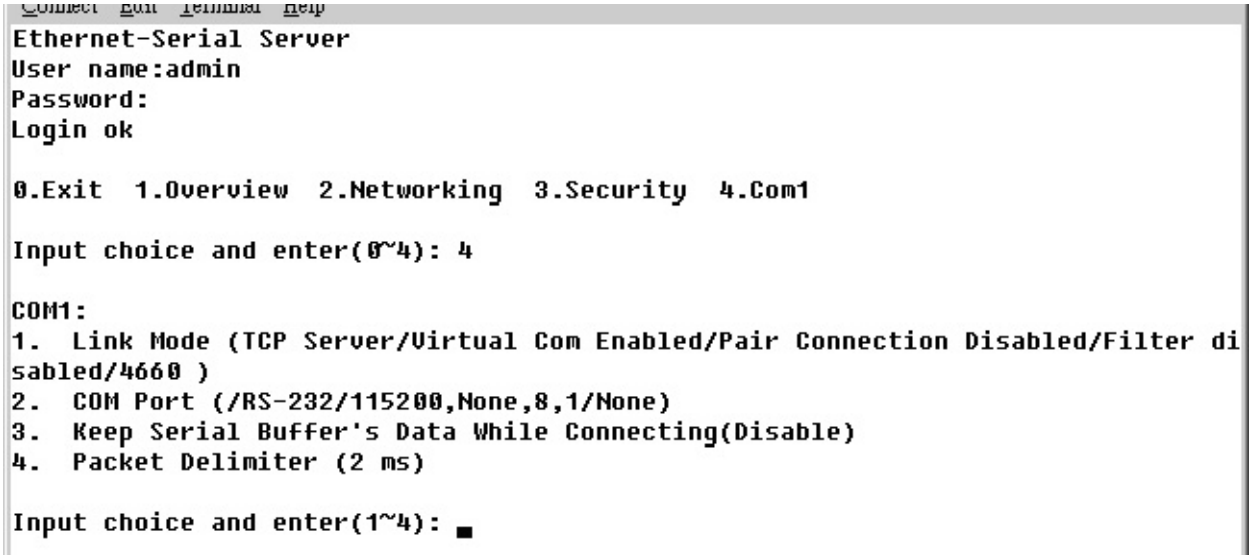
### COM1 Setup

Select "4" from "Input choice and enter (0~4):" the following screen appears:


Connect Edit Terminal Help
Ethernet-Serial Server
User name:admin
Password:
Login ok
0.Exit 1.Overview 2.Networking 3.Security 4.Com1
Input choice and enter(0~4): 4
COM1:
1. Link Mode (TCP Server/Virtual Com Enabled/Pair Connection Disabled/Filter disabled/4660 )
2. COM Port (/RS-232/115200,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Disable)
4. Packet Delimiter (2 ms)
Input choice and enter(1~4):

The page gives you the opportunity to configure parameters of COM1 setting which include COM1 working mode, port parameters, enabling or disabling serial buffer's data and setting packet delimiter.

### LINK1 Setup

Type 1 from "Input choice and enter (1~4):" of COM1, the following screen appears. Configure STE-601C as TCP server and the local port is 4660. IP filter is disabled by default, if IP filter is enabled, only source IP 10.0.0.154 can connect to STE-601C.

**Note:** IP filtering function is disabled if setting FILTER_IP to "0.0.0.0".

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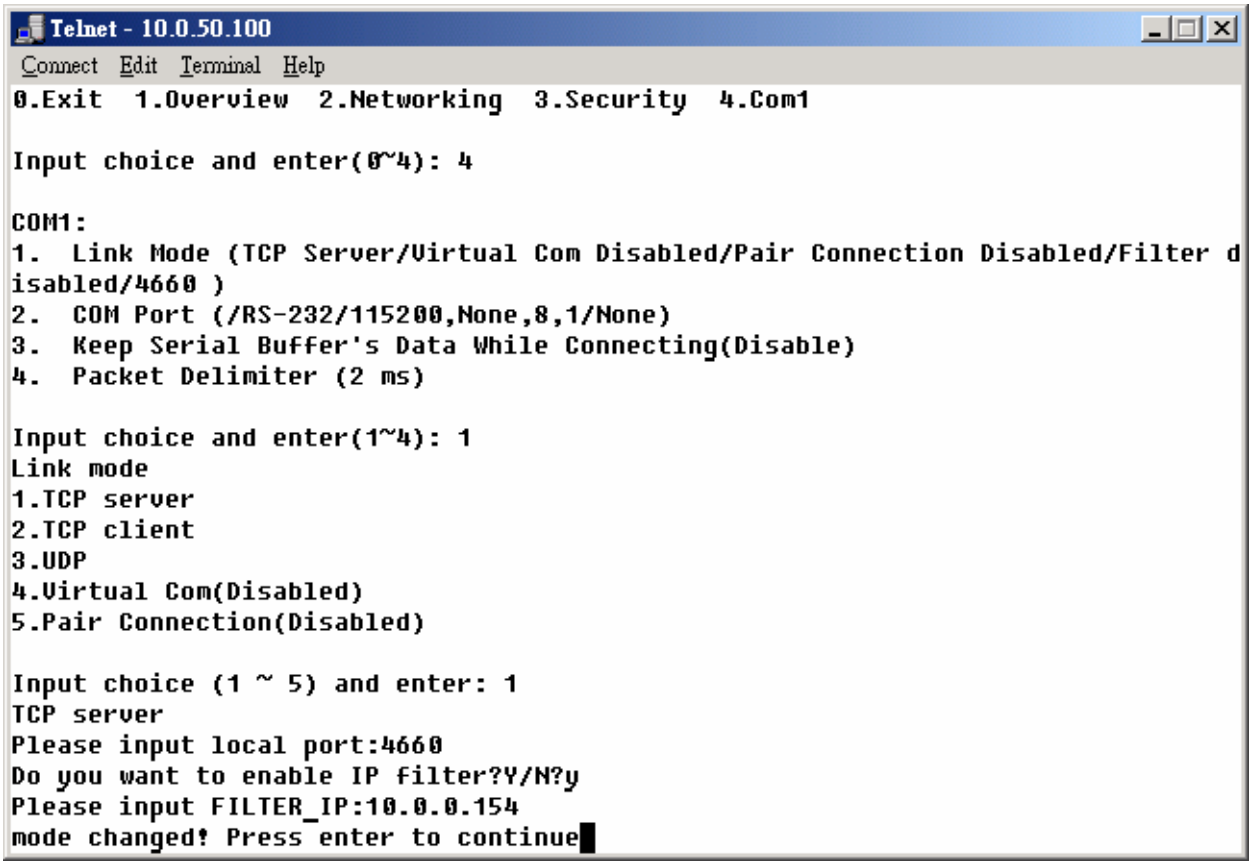
Telnet - 10.0.50.100
Connect Edit Terminal Help
0.Exit 1.Overview 2.Networking 3.Security 4.Com1
Input choice and enter(0~4): 4
COM1:
1. Link Mode (TCP Server/Virtual Com Disabled/Pair Connection Disabled/Filter d
isabled/4660 )
2. COM Port (/RS-232/115200,None,8,1/None)
3. Keep Serial Buffer's Data While Connecting(Disable)
4. Packet Delimiter (2 ms)
Input choice and enter(1~4): 1
Link mode
1.TCP server
2.TCP client
3.UDP
4.Virtual Com(Disabled)
5.Pair Connection(Disabled)
Input choice (1 ~ 5) and enter: 1
TCP server
Please input local port:4660
Do you want to enable IP filter?Y/N?y
Please input FILTER_IP:10.0.0.154
mode changed! Press enter to continue

Configure STE-601C as TCP client, the destination IP is 10.0.29.123, destination port is 1234.

```
0.Exit  1.Overview  2.Networking  3.Security  4.Com1

Input choice and enter(0~4): 4

COM1:
1.  Link Mode (TCP Server/Virtual Com Enabled/Pair Connection Disabled/Filter di
sabled/4660 )
2.  COM Port (/RS-232/115200,None,8,1/None)
3.  Keep Serial Buffer's Data While Connecting(Disable)
4.  Packet Delimiter (2 ms)

Input choice and enter(1~4): 1
Link mode
1.TCP server
2.TCP client
3.UDP
4.Virtual Com(Enabled)
5.Pair Connection(Disabled)

Input choice (1 ~ 5) and enter: 2
TCP client
Please input destination IP:10.0.29.123
Please input destination port:1234
mode changed! Press enter to continue
```

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Configure STE-601C as UDP client, the local port is 4660, the destination IP is 10.0.29.254, destination port is 1234.

```
0.Exit  1.Overview  2.Networking  3.Security  4.Com1

Input choice and enter(0~4): 4

COM1:
1.  Link Mode (TCP Client/Virtual Com Disabled/Pair Connection Disabled/Remote 1
0.0.29.123/1234)
2.  COM Port (/RS-232/9600,None,8,1/None)
3.  Keep Serial Buffer's Data While Connecting(Disable)
4.  Packet Delimiter (2 ms)

Input choice and enter(1~4): 1
Link mode
1.TCP server
2.TCP client
3.UDP
4.Virtual Com(Disabled)
5.Pair Connection(Disabled)

Input choice (1 ~ 5) and enter: 3
UDP
Please input local port:4660
Please input destination IP:10.0.29.254
Please input destination port:1234
mode changed! Press enter to continue
```

**COM port setting**

Type 2 from "Input choice and enter (1~4):" of COM1, the following screen appears, you can then give the COM port alias name, set the baud rate and parity, determine number of data bit and stop bit, and decide if you want to use flow control and the type of flow control you want to use.

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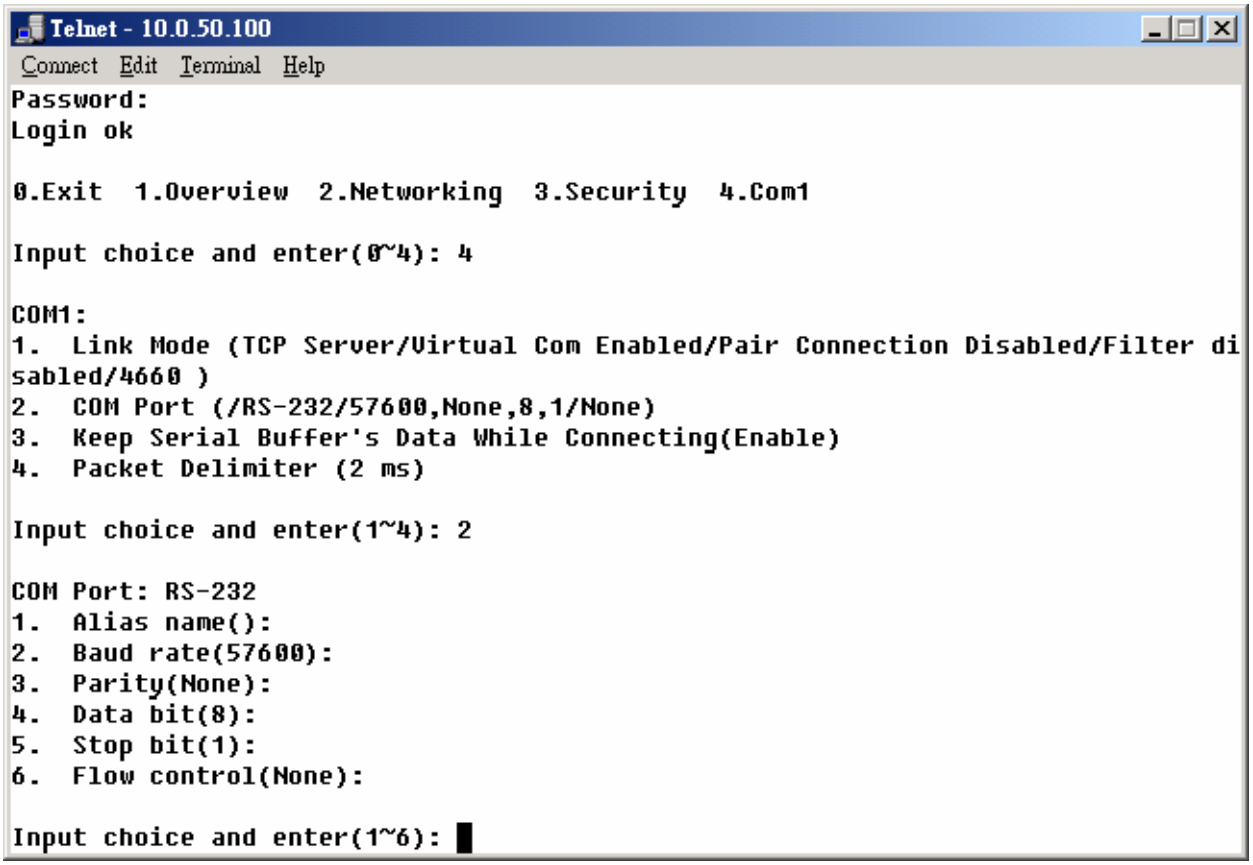


**Enabling serial data buffer**

Type 3 from "Input choice and enter (1~4):" of COM1, by default COM port serial data buffer is enabled meaning that when TCP/IP Ethernet connection is broken, serial data collected from serial device will be kept in STE-601C, once TCP/IP connection is resumed, the serial data will be sent through Ethernet connection, you can disable it if you wish.

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```
Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit  1.Overview  2.Networking  3.Security  4.Com1

Input choice and enter(0~4): 4

COM1:
1.  Link Mode (TCP Server/Virtual Com Enabled/Pair Connection Disabled/Filter di
sabled/4660 )
2.  COM Port (/RS-232/57600,None,8,1/None)
3.  Keep Serial Buffer's Data While Connecting(Enable)
4.  Packet Delimiter (2 ms)

Input choice and enter(1~4): 3

Keep serial Buffer's Data While Connecting
(1)Enable (2)Disable
Please select keep type:1
Keep type changed! Press enter to continue
```

**Setting packet delimiter**

Packet delimiter is a way of controlling packets within serial communication. It can prevent packets from being cut thus keep the packets complete. STE-601C provides two ways of parameter setting as inter character timer and terminator. By default packet delimiter timer is 1 ms, you can change timer shown in the following figure:

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```
Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit  1.Overview  2.Networking  3.Security  4.Com1

Input choice and enter(0~4): 4

COM1:
1.  Link Mode (TCP Server/Virtual Com Enabled/Pair Connection Disabled/Filter di
sabled/4660 )
2.  COM Port (/RS-232/57600,None,8,1/None)
3.  Keep Serial Buffer's Data While Connecting(Enable)
4.  Packet Delimiter (0x0d0a)

Input choice and enter(1~4): 4

Packet delimiter
(1)Timer (2)Characters
Please select delimiter type:1
Please input timer(0 ~ 30000 ms):2
Delimiter changed! Press enter to continue
```

You can also choose character pattern as the packet delimiter indicated in the following figure:

```
Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit  1.Overview  2.Networking  3.Security  4.Com1

Input choice and enter(0~4): 4

COM1:
1.  Link Mode (TCP Server/Virtual Com Enabled/Pair Connection Disabled/Filter di
sabled/4660 )
2.  COM Port (/RS-232/57600,None,8,1/None)
3.  Keep Serial Buffer's Data While Connecting(Enable)
4.  Packet Delimiter (10 ms)

Input choice and enter(1~4): 4

Packet delimiter
(1)Timer (2)Characters
Please select delimiter type:2
Please input pattern(max 2 bytes, ex:0x0d0a):0x0d0a
Delimiter changed! Press enter to continue
```

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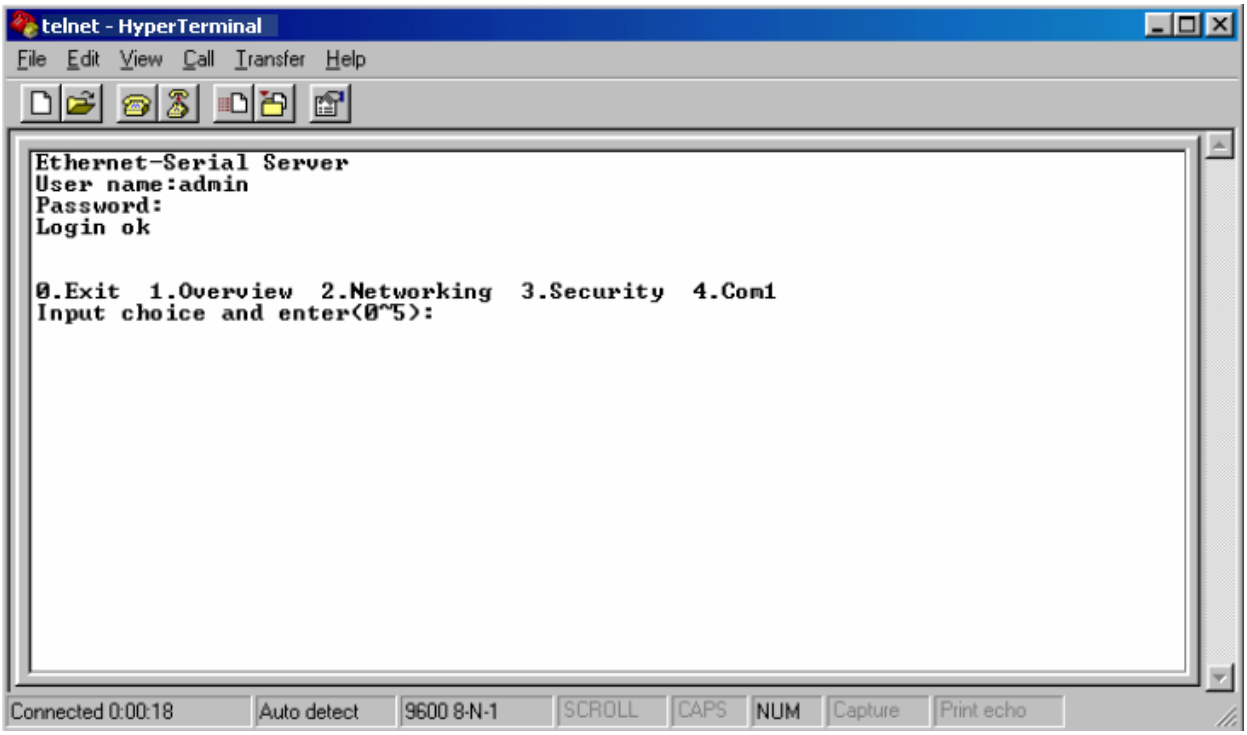
## 4.3 Configuration set by Hyper Terminal console utility

1. Power off STE-601C.
2. Set the MODE switch SW1 to 'OFF' and SW2 to 'ON'.
3. Use a PC to connect to STE-601C's console with RS-232 cross over cable.
4. Power on STE-601C.
5. Open a Hyper Terminal program from your computer Start menu -> Programs -> Accessories -> Communication -> Hyper Terminal, set COM2 parameters as follows.
   - Baud rate: 9600 bps
   - Data bit: 8 bits
   - Parity: None
   - Stop bit: 1bit
   - Flow control: None

   **Note**:

   At present time baud rate is fixed at **9600, 8, n, 1, without flow control** for console port communication, RS-232C parameters of your computer COM port and STE-601C must be the same.
6. Once Hyper Terminal is connected, type in username and password then the following Hyper Terminal window appears,




7. The following configuration operations are totally the same as those by Telnet.
8. After finishing console settings, power off STE-601C, put SW1 and SW2 back to the previous setting.

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## 4.4 Configuration set by web browser

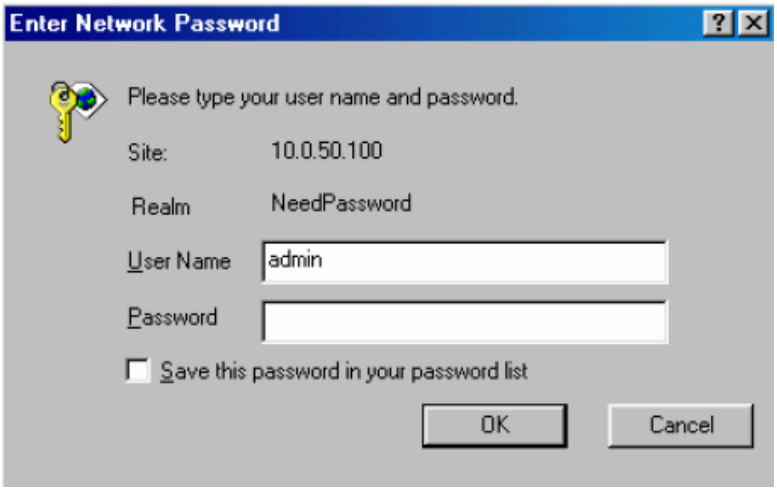
It is also possible to modify various settings through the web server interface. To do so, please follow the steps below.

**Log in to the system**

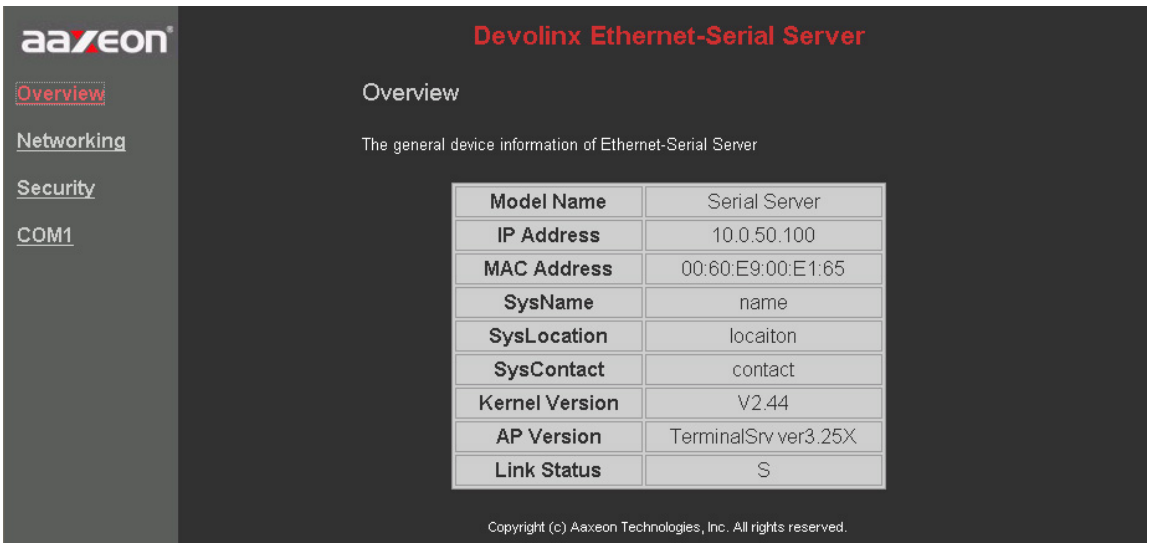
1. From web browser, type in the IP address of STE-601C in the URL.

   **Example: http://10.0.50.100**

2. The following authentication screen appears. Please type in user name and password then click on OK. The user name is admin and password is null by default.




3. The following overview page appears.




**Change the password**

1. Click on the "Security" link and the following screen appears.

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Devolinx Ethernet-Serial Server
Overview
Networking
Security
COM1
Security
The default password is null, you can change the password by filling in the new password to New Password and Verified Password fields, be aware that password is case sensitive.
Old Password
New Password
Verified Password
Save Configuration

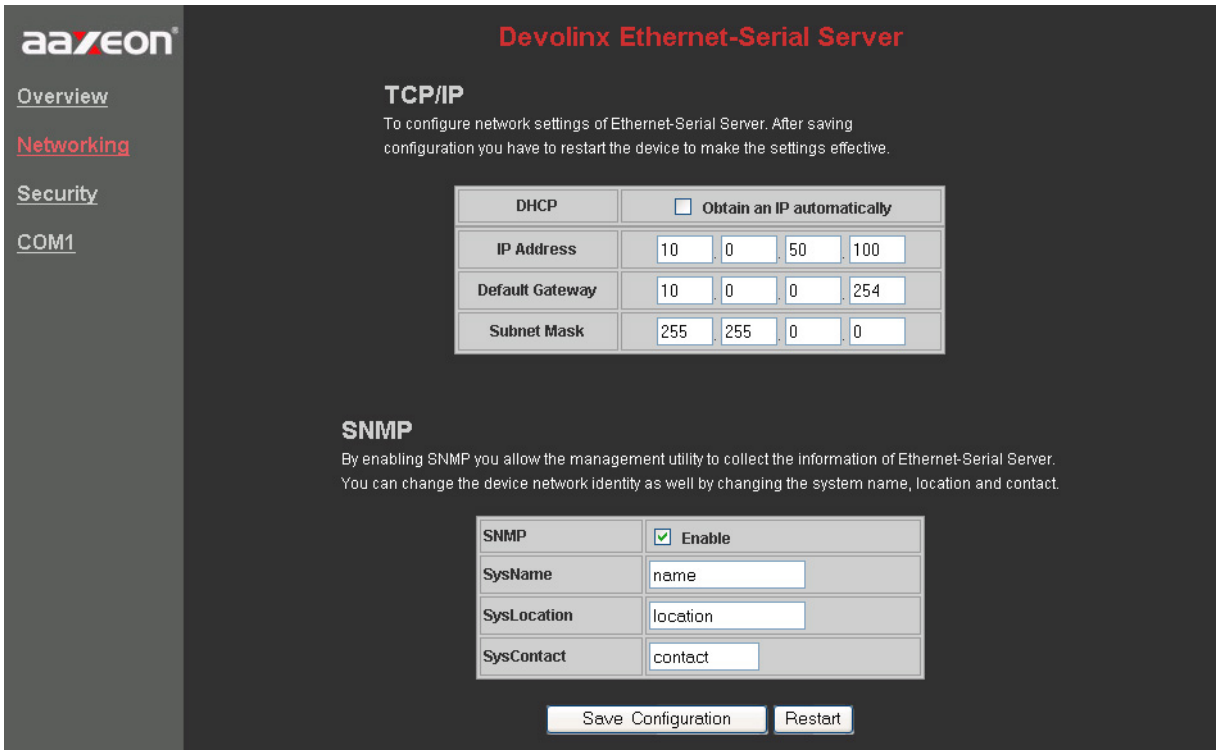
2. Please input the old password in the "Old Password" field, input the new password in the "New Password" and the "Verified Password" fields, and then click on "Save Configuration" to update the password.

   **Note:** You can press the default key of product to reset password to the default value.

### Network setup

Click on the "Networking" link and the following screen appears. Fill in IP information under TCP/IP field. Alternatively, you can do the configuration by clicking on DHCP to obtain auto IP address, gateway and subnet mask information.

Enable SNMP by checking "Enable", fill in network identification information under SNMP field and click on the "Save Configuration" button to save the changes, please notice that the setting will not become effective until you restart STE-601C.

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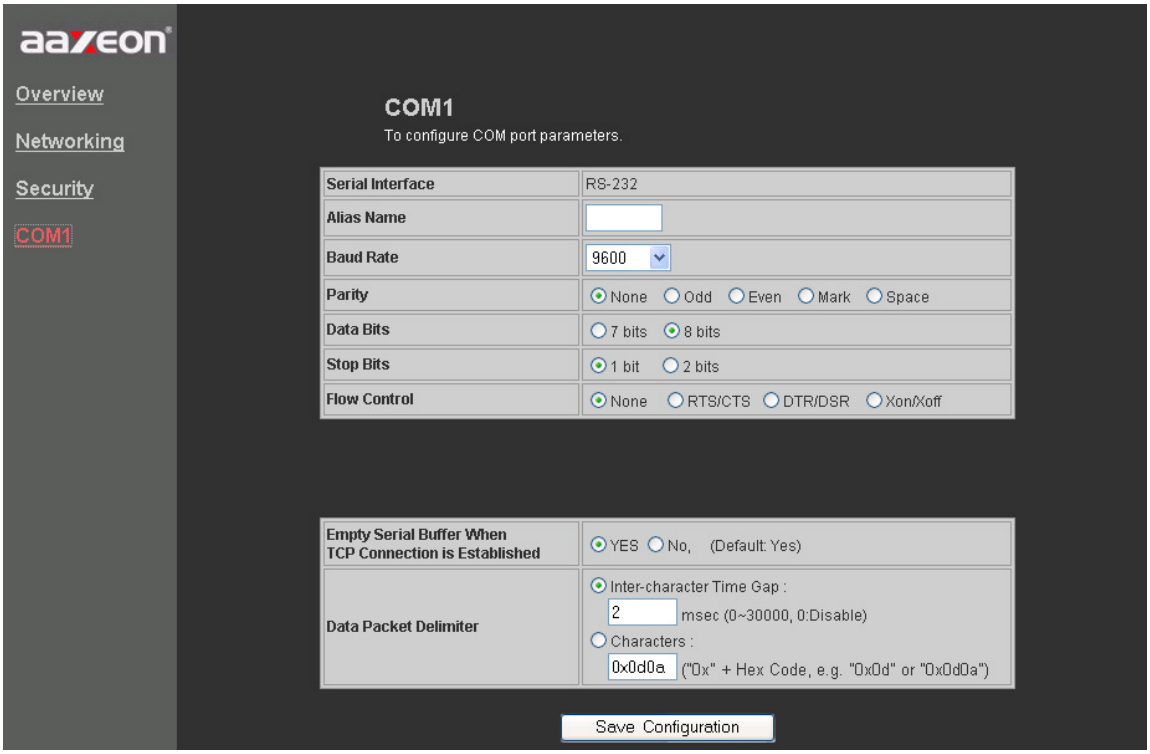
### COM1 Setup

1. Click on the **"COM1"** link and the following screen appears. Fill in COM1 parameter information under COM1 field then click on "Save Configuration" button to save the changes.




### LINK1 Setup

1. Click on the **"COM1"** link and the following screen appears, you can configure STE-601C as transparent mode by default. Configure STE-601C as TCP server and the local port is 4660, IP filter is disabled by default, if IP filter is enabled, only source IP 10.0.29.11 can connect to STE-601C.

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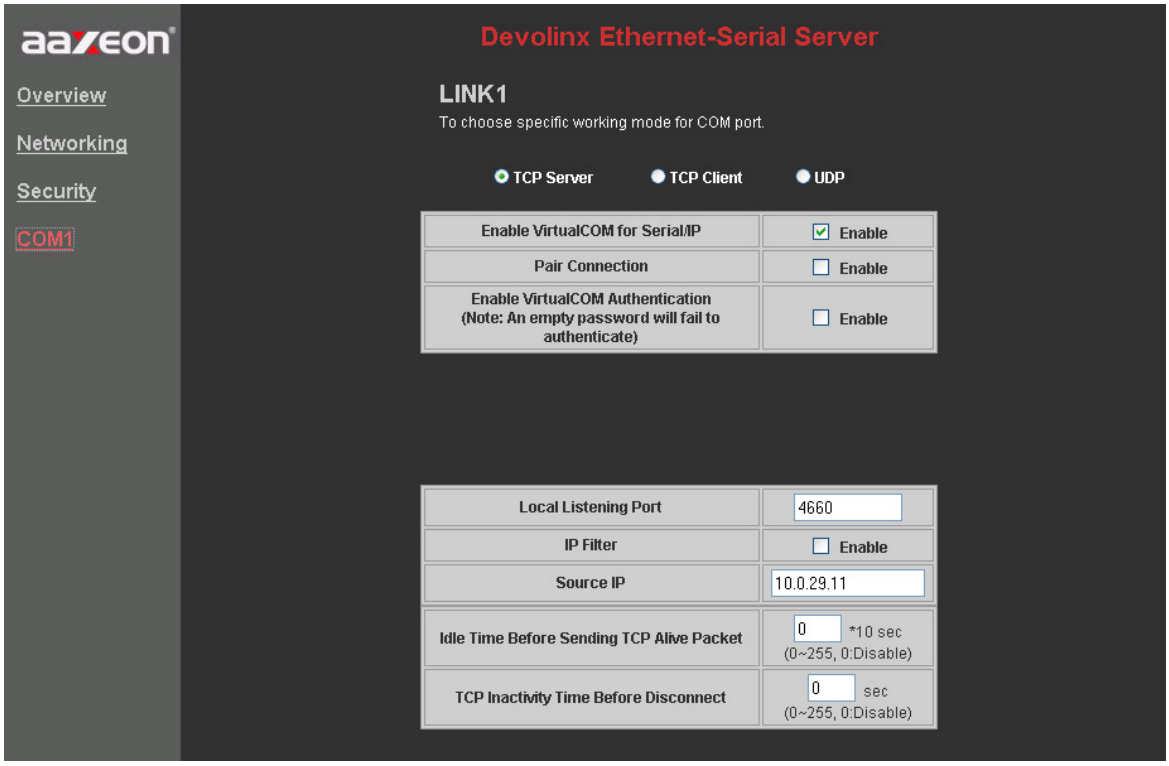
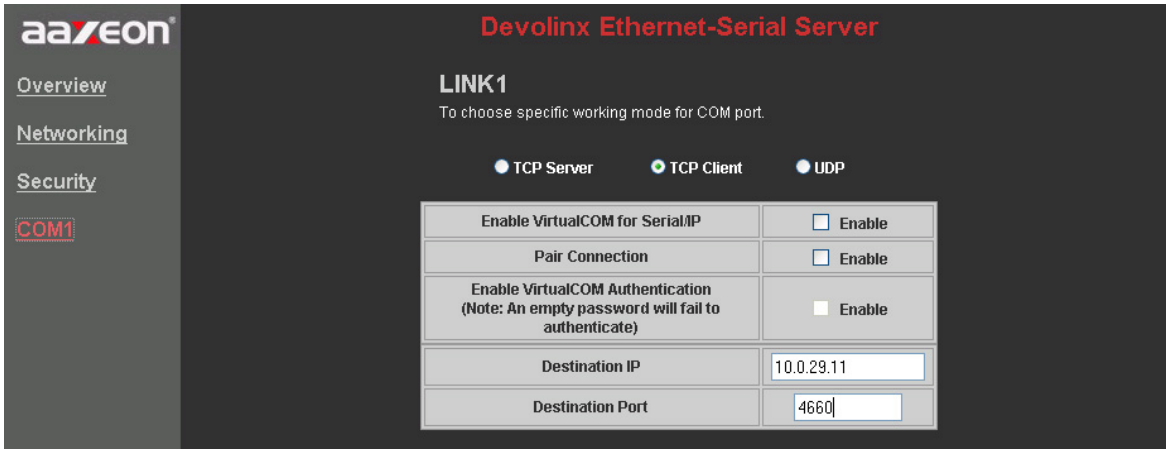



Configure STE-601C as TCP client, the destination IP is 10.0.29.11, destination port is 4660.




**Pair Connection**

In the case of the serial connection is established with two or more STE-601C to send data over Ethernet network, i.e. pair connection mode, you can choose "pair connection" which is indicated in the following figure to cope with any type of serial device.

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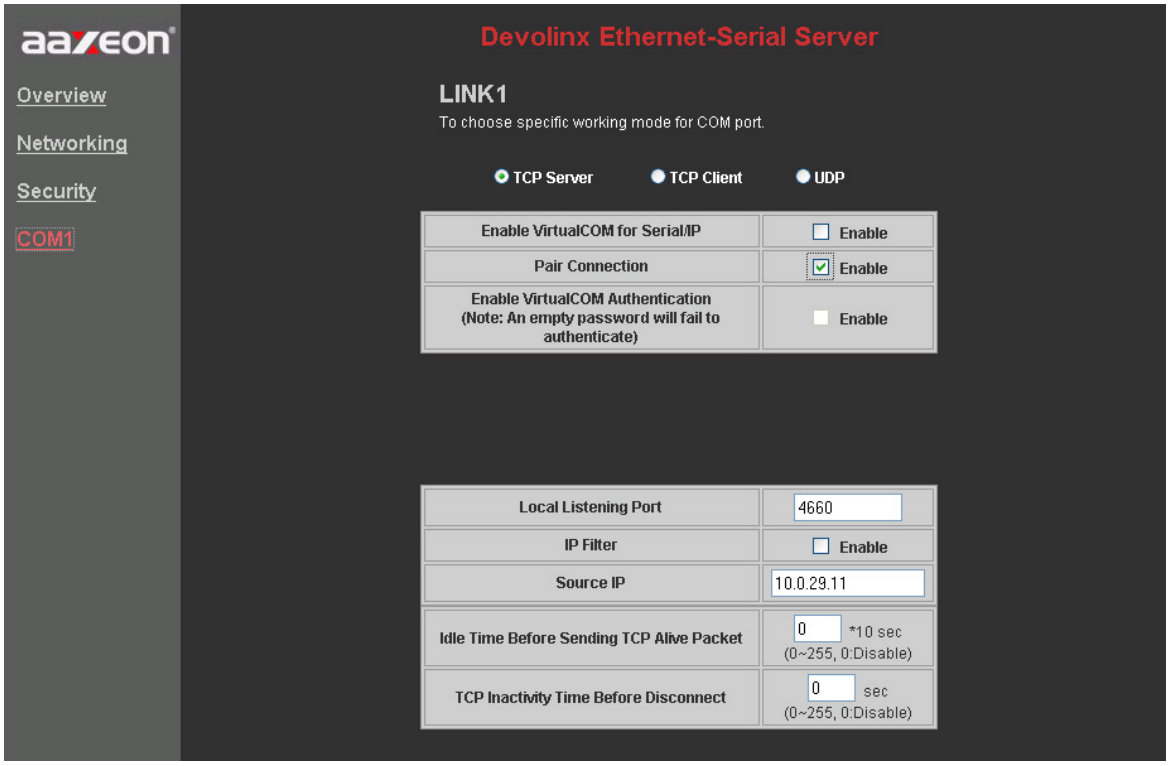
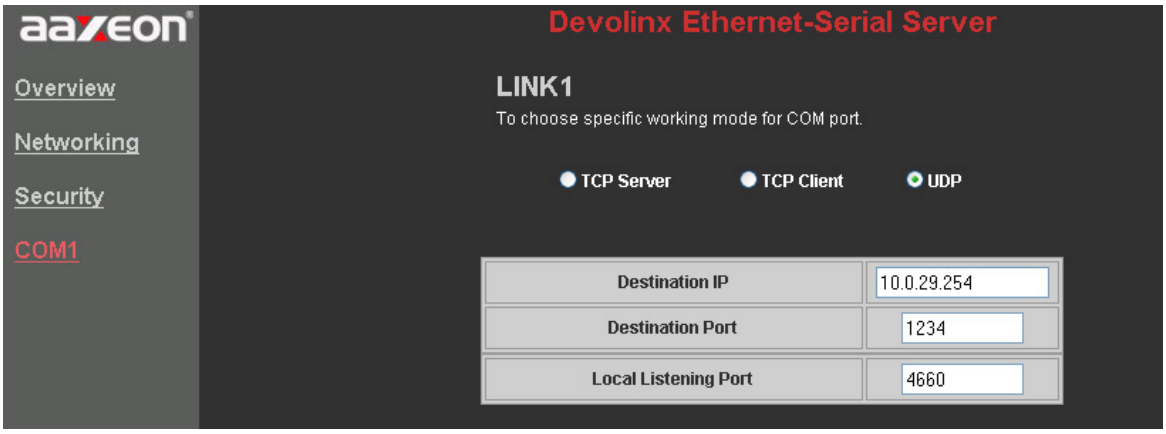
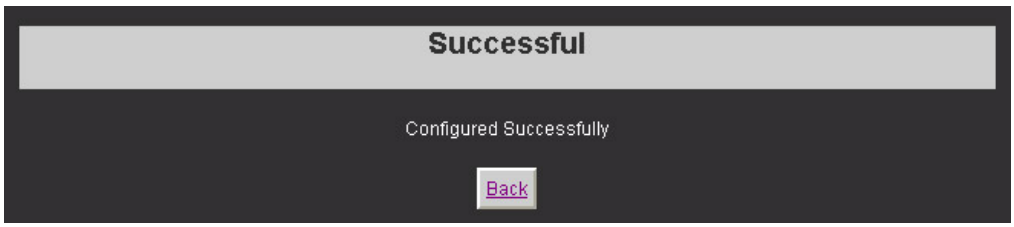



Configure STE-601C as UDP mode. Local port is 4660, destination IP is 10.0.29.254 and destination port is 1234.




2. Click on "Save Configuration" to save the changes.
3. If the update is successful, the following screen appears.

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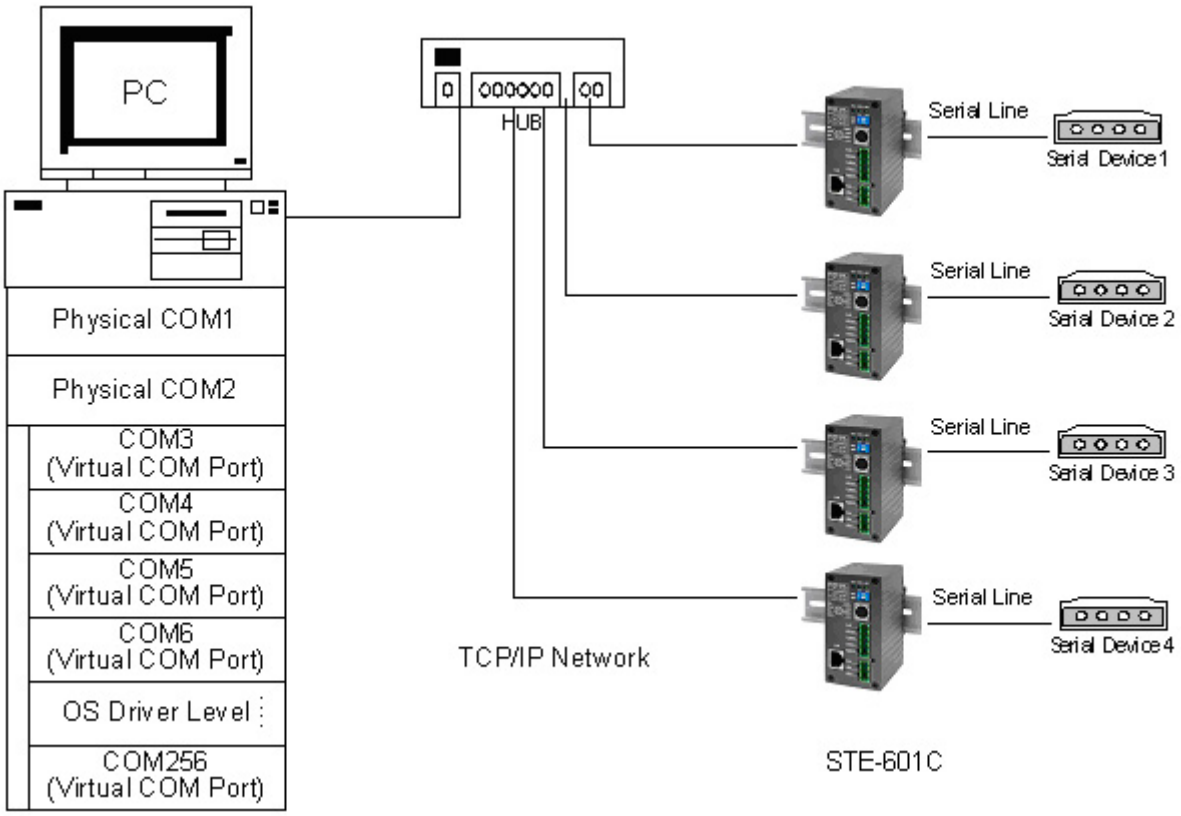
## 4.5 Virtual COM Mode

Virtual COM driver mode for windows converts COM data to LAN data to control the RS-232C port on a STE-601C via the LAN. By creating virtual COM ports on the PC, Virtual COM redirects the communications from the virtual COM ports to an IP address and port number on a STE-601C that connects the serial line device to the network. The following figure is Virtual COM connection diagram.




### 4.5.1 Setup of a virtual COM driver

**Pre-installation requirements**

Please check the operation system on your PC complied with the following requirements:

- Processor: Intel-compatible, Pentium class
- Operation system: Windows Server 2003, Windows XP, Windows 2000, Windows NT 4.0 SP5 or later, Windows Me, Windows 98, Windows 95, Microsoft NT/2000 Terminal Server, Citrix MetaFrame
- Windows Installer 2.0
- Network: Microsoft TCP/IP networking software

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Applying to the serial server

**Cautions on Use**

Virtual COM supports firmware AP v3.4 and above for the STE-601C Serial-Ethernet Servers.

**Limitation**

Virtual COM driver provides user to select up to 256 **COM ports** as Virtual COM ports in a monitoring PC. User can select them from a list of COM ports, which is from COM1 up to COM256.

**Installation**

Make sure you have turned off all anti-virus software before beginning the installation. Run the Virtual COM ".exe" program included in the CD to install Virtual COM for your operating system.

In the end of the installation, please select one or two COM ports to become the Virtual COM ports.

**Uninstalling**

1. From Windows Start menu select Setting, Control Panel, Add/Remove Programs.
2. Select **Serial IP** in the list of installed software.
3. Click the **Add/Remove** button to remove the program, or From Windows Start menu select Programs, Serial IP, **Uninstall Serial IP** to remove the program.

## 4.5.2 Virtual COM communication

### 4.5.2.1 Enable Virtual COM on STE-601C

From web browser access to STE-601C by typing its IP address, click on COM1 link to access COM1 page, on the top half of the page click on "**TCP Server**" and enable Virtual COM by putting a check in front of the "Enable" button, then type in the local port number in the "**Local Port**" field as indicated in the following figure:

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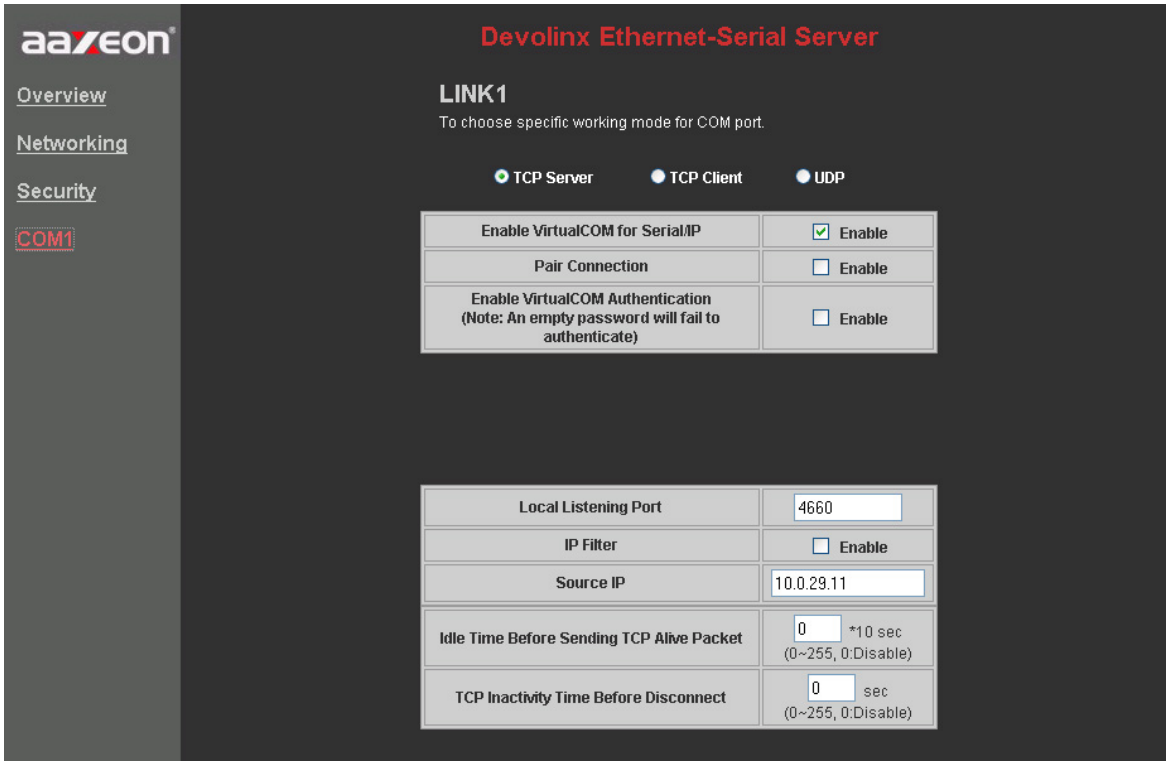
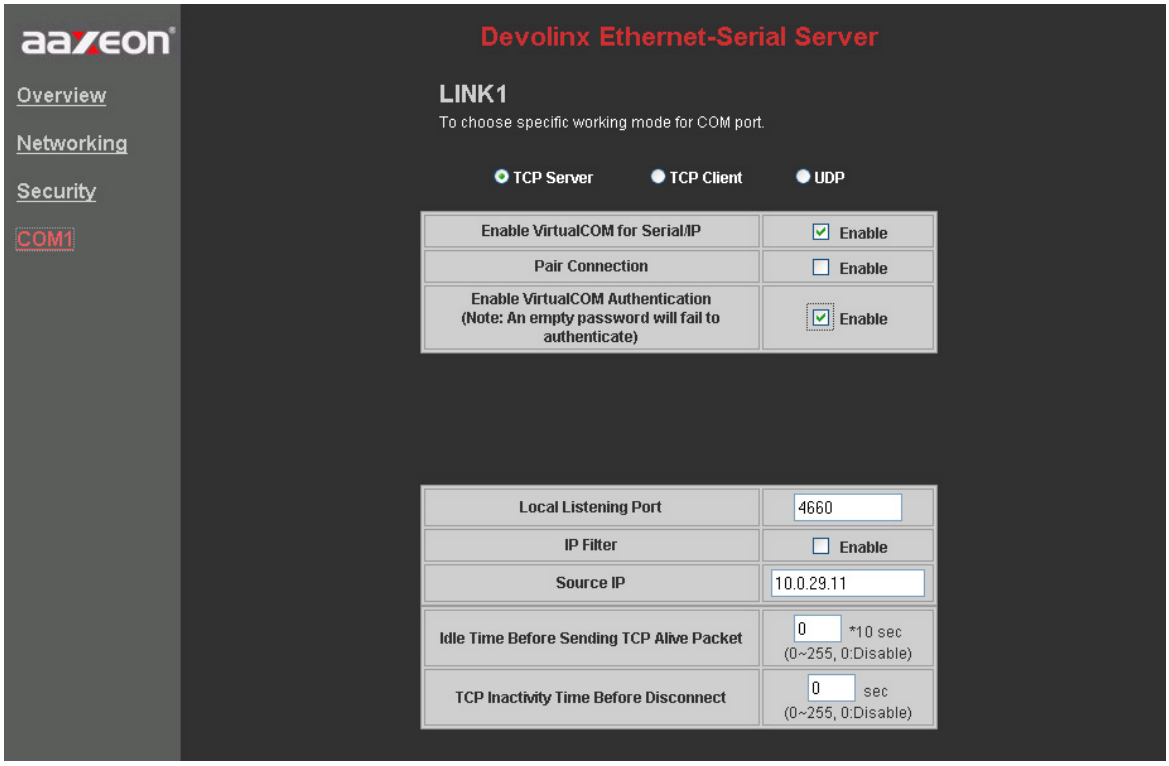



For the users of Mitsubishi A-Series PLC, it may be recommended to enable "**Mitsubishi A-Series PLC**" in the case of some connection problems occurred.




Or you can enable Virtual COM through telnet configuration by setting COM1 as TCP server, and type in the

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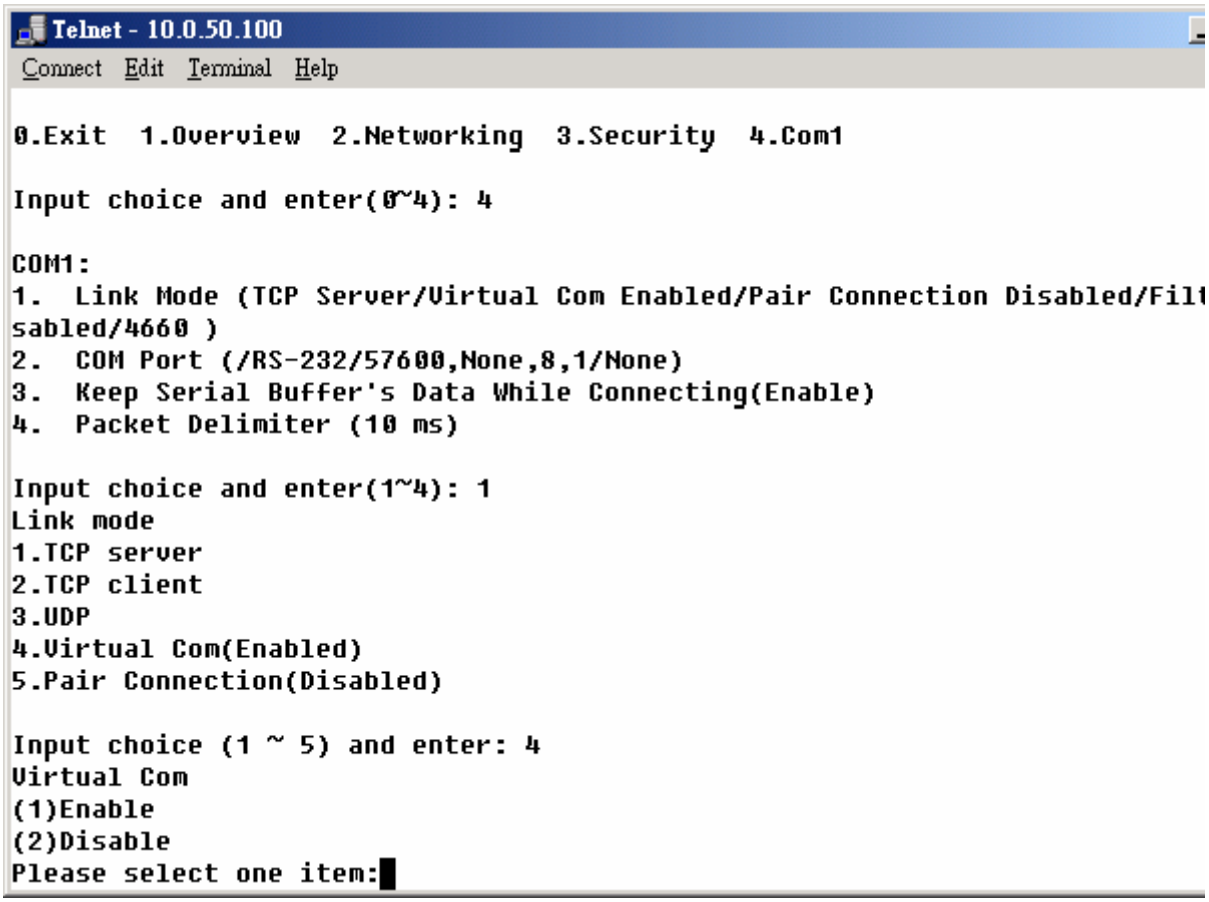
local port number for COM1, then enable virtual COM as shown in the following figure:




#### 4.5.2.2 Run Serial/IP program on monitoring PC

In the Window Start Menu, select the Serial/IP program group and select **Serial/IP Configuration**. The configuration window is shown as following:

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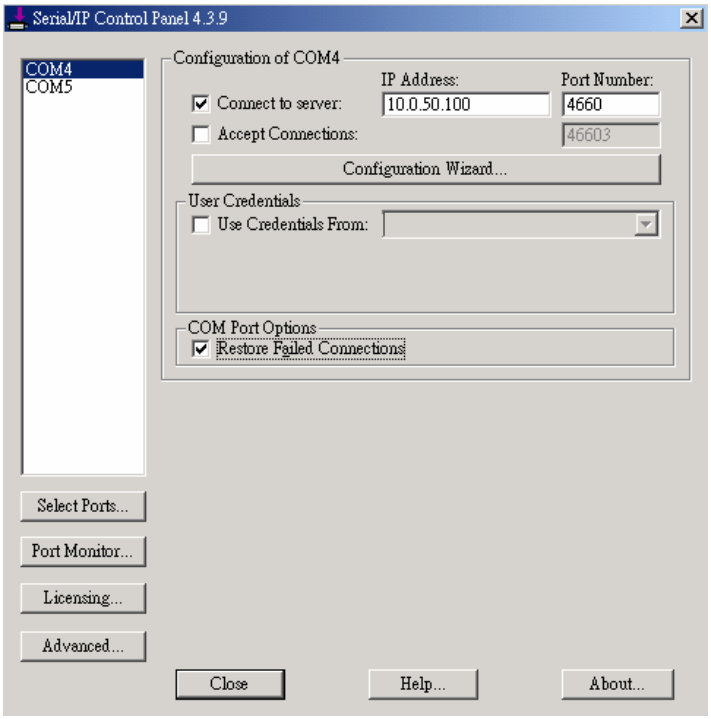


At right is a sample Virtual COM Control Panel window. At the left is the list of the COM ports that you have selected (in the Select Ports window) for use by the Virtual COM Redirector. If you wish to change which ports appear in this list, use the **Select Ports** button.

Each COM port has its own settings. When you click on a COM port, the Control Panel display changes to reflect the settings for that COM port.

**Note:** When you change settings for a COM port, the changes are effective immediately. There is no separate confirmation dialog to confirm or cancel your changes.

### Configuring Virtual COM Ports

You configure each Serial/IP COM port as follows:

1. Select a COM port in the list.
2. For **IP Address of Server**, enter a numeric IP address for the serial server.
3. For **Port Number**, enter the TCP port number that the serial server uses to provide its serial ports to the network.
4. For **Server Credentials**, the default is **No Login Required**. If your serial server does require a login by the Virtual COM Redirector, the Virtual COM Redirector needs to provide a username and/or password every time an application tries to use the serial server.
5. Click the **Configuration Wizard** button and then click the **Start** button that appears in the wizard window. This important step verifies that the Virtual COM Redirector can communicate with the serial server using the settings you have provided. If the **Log** display does not show errors, click the **Use Settings** button in the wizard, which makes the recommended settings effective and returns you to the Control Panel to continue with the following steps.

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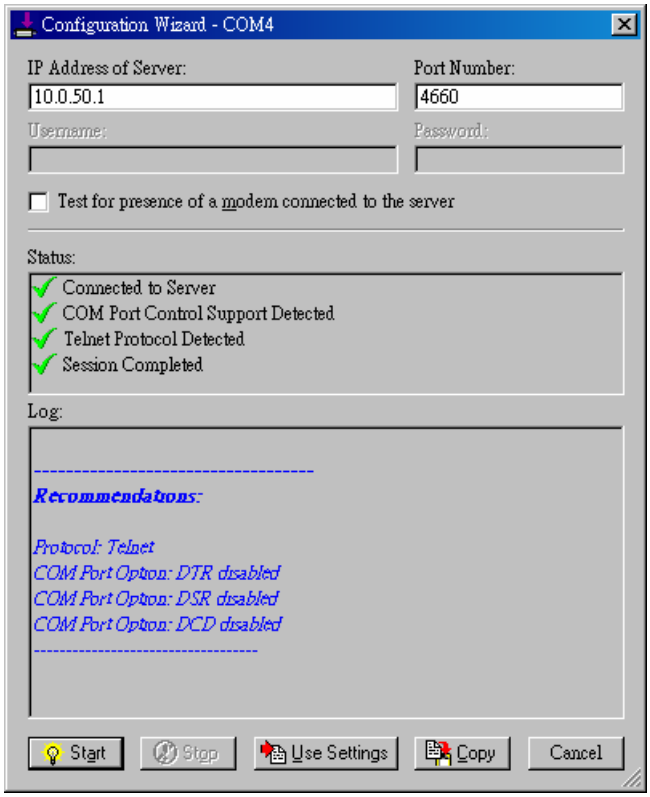


6. For Connection Protocol, the setting must match the TCP/IP protocol that the serial server supports. The Configuration Wizard is usually able to determine the correct setting.
7. For COM Port Options, the settings must match the COM port behavior expected by the PC application that will use this COM port. The Configuration Wizard will recommend a combination of settings.

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# 5. SNMP Setup

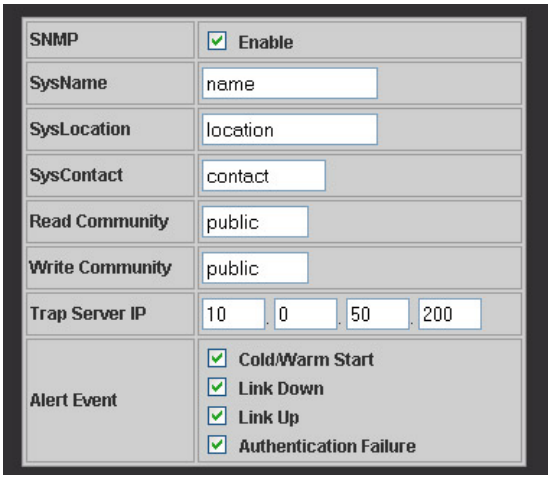
## SNMP Network Management Platform

STE-601C is an SNMP device that allows many popular SNMP Network management platforms such as HP OpenView and SunNet Manager to conduct monitoring on the device.

Depending on the network management tools you are using, device (STE-601C) information can be collected from running the management tools including IP address, DNS name, system descriptions and NIC information etc.

## SNMP Network Management Platform

- Cold/Warm Start
- Link Down
- Link Up
- Authentication Failure

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# 6. Start Writing Your Own Applications

Before you start writing your host applications or programs to interact with STE-601C, please make sure you have done the following.

## Preparing the System

1. Properly connect STE-601C hardware including power, Ethernet and RS-232/RS-485 cables.
2. Properly configure the parameters of STE-601C including connection type, IP address, gateway IP address, and network mask accordingly (see chapter 3 **Hardware Installation** section).
3. Configure STE-601C as TCP Server using default TCP port number 4660.
4. The host (PC) application program must be configured as a TCP client and connects to STE-601C with designated TCP port number 4660 for COM1.
5. Make sure STE-601C is running by checking the running status through **monitor.exe** configuration utility.
6. If test OK, begin writing custom application.
   **Refer to your chosen programming language guide for socket application development.*

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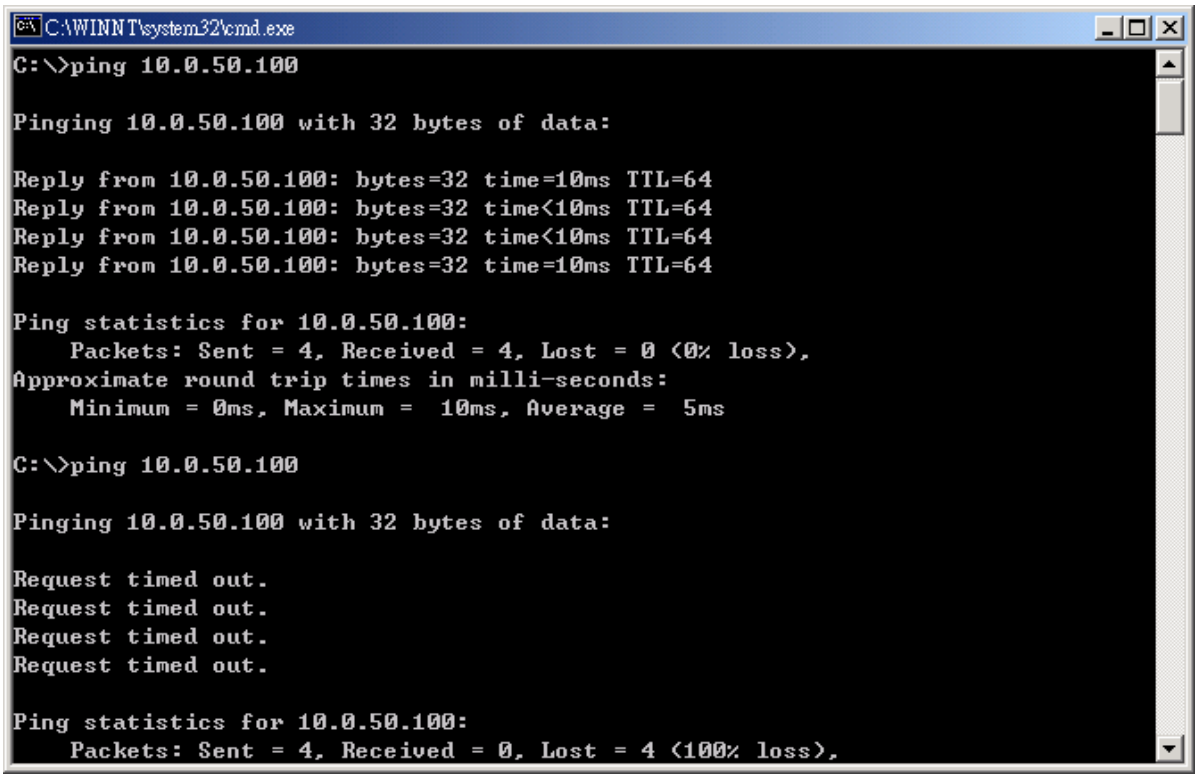
# 7. Diagnostics

There are several ways you can check on the status and availability of STE-601C.

## 7.1 Use Standard TCP/IP Utility *ping* Command

From Windows **Start** menu, select **Run** and type in "**ping <TCP Server IP address>**".

If the connection is established, the Reply messages are displayed, otherwise it will indicate Request timed out.


C:\WINNT\system32\cmd.exe
C:\>ping 10.0.50.100
Pinging 10.0.50.100 with 32 bytes of data:
Reply from 10.0.50.100: bytes=32 time=10ms TTL=64
Reply from 10.0.50.100: bytes=32 time<10ms TTL=64
Reply from 10.0.50.100: bytes=32 time<10ms TTL=64
Reply from 10.0.50.100: bytes=32 time=10ms TTL=64
Ping statistics for 10.0.50.100:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 10ms, Average = 5ms
C:\>ping 10.0.50.100
Pinging 10.0.50.100 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 10.0.50.100:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

## 7.2 Use monitor.exe Configuration Utility Program

Use monitor.exe configuration program that comes with the product CD or diskette to check on the status of STE-601C. The status can be read from "***AP version***" column of the tool.

| Status | Descriptions |
|---|---|
| **S** | The system is configured as a TCP Server and not yet connected. |
| **C** | The system is configured as a TCP Client and not yet connected. |
| **U** | The system is configured as an UDP. |
| **A** | The TCP Server and is connected. |
| **B** | The TCP Client and is connected. |

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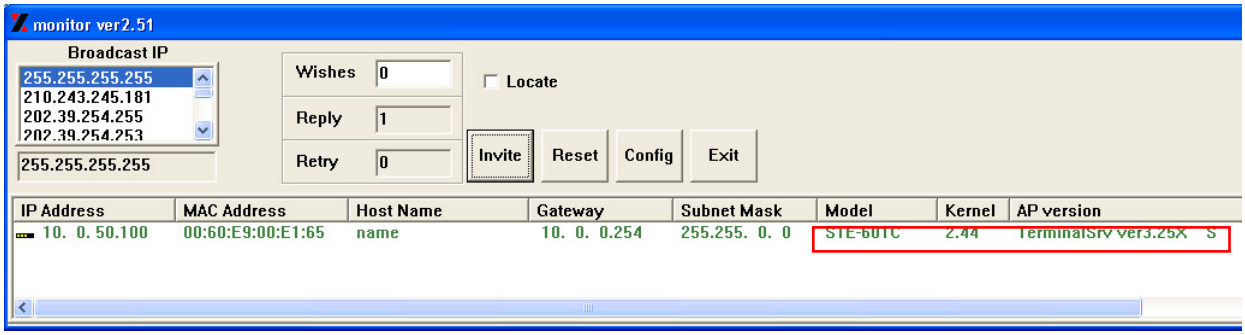
For example, **'s'** means that COM1 is server mode and is not connected.

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# Appendix A: STE-601C Ethernet-Serial Server Specifications

## A.1. Hardware Specifications

| | Specifications |
|---|---|
| **CPU** | • 16-bit Embedded CPU |
| | • 100MHz |
| **Flash Memory** | • 512K Bytes |
| **SDRAM** | • 512K Bytes |
| **EEPROM** | • 512 Bytes |
| **Host Communication** | • IEEE802.3 base band |
| | • TCP/IP, UDP, SNMP, HTTP, Telnet, ARP, BOOTP, DHCP |
| **Reset** | • Built-in default key to restore factory default settings |
| **Watch Dog Timer** | • 1.34 second hardware auto reset |
| | • Power failure threshold: 4.75V |
| **Serial Port Communication** | • One RS-232 or RS-485 selectable |
| | • RS-232: EIA-RS-232C standard, Full Duplex, 8 pins Mini-DIN or 5 pins terminal block |
| | • RS-485: 2/4 wires, Half/Full duplex, 8 pins Mini-DIN or 5 pins terminal bl |
| | • Parameters<br>1) Baud-rate: 1200 bps ~ 230400 bps<br>2) Parity: None, Even, Odd, Mark, Space<br>3) Data bits: 7,8<br>4) Stop bits: 1,2<br>5) Packet Delimiter: by inter-character timeout, by characters delin<br>6) Flow Control: None, Hardware CTS/RTS, Software Xon/Xoff |
| **LED indication** | • RUN x 1 |
| | • LAN x 1 |
| | • COM port1 |
| **Power Requirement** | • +9~30Vdc, 2.8 Watt Max |
| **Temperature** | • Operation: 0℃ to 60℃ |
| | • Storage: -40℃ to 70℃ |
| **Humidity** | • 20%~90% non-condensing |
| **Housing** | • 91mm(L) x 46mm(W) x 76mm(H) |

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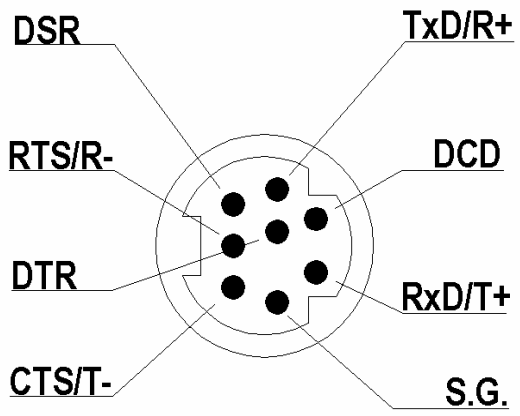
## A.2. Software Specifications

| Item | Specifications |
|---|---|
| **Protocol** | TCP, UDP, ARP, ICMP, SNMP, HTTP, Telnet, BOOTP,DHCP |
| **Configuration** | • Configuration information for both TCP/IP and serial ports is kept in the EEPROM.<br>• Configuration utilities of Windows 95/98/2000/NT/XP/2003 are provided for configuring settings. |
| **Internal Buffer Size** | • TCP receiving buffer size = 8K bytes<br>• TCP transmitting buffer size = 16K bytes<br>• RS-232/RS-485 receiving buffer size = 4K bytes<br>• RS-232/RS-485 transmitting buffer size = 4K bytes |

## A.3 Connector Pin Assignments

### A.3.1 COM Port

**8 pin Mini DIN connector**

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Aaxeon provides Mini DIN connector to DB9 connector cable, the pin assignments of DB9 connector is shown in the following table:

| Pin# | RS-232<br>Full Duplex | RS-485<br>2 wire, Half Duplex | RS-485/422<br>4 wire, Full Duplex |
|---|---|---|---|
| 1 | DCD | N/A | N/A |
| 2 | RXD | N/A (reserved) | **TXD+** |
| 3 | TXD | **DATA+** | **RXD**+ |
| 4 | DTR | N/A | N/A |
| 5 | SG (Signal Ground) | SG (Signal Ground) | SG (Signal Ground) |
| 6 | DSR | N/A | N/A |
| 7 | RTS | **DATA-** | **RXD-** |
| 8 | CTS | N/A (reserved) | **TXD-** |
| 9 | N/A | N/A | N/A |

**Note:** RS485 2 or 4 pins assignments of DB9 connector are different from those of Mini DIN connector.

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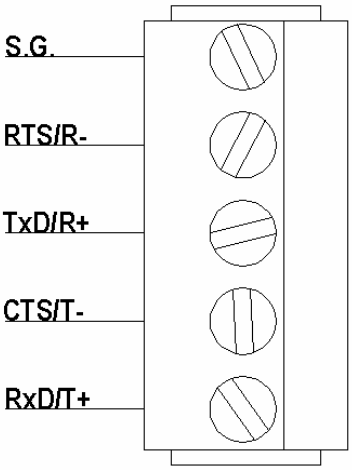
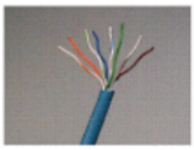
**Terminal Block Connector**




RS485 only uses RTS/R- and TxD/R+ for data communication while RS232 or RS422 uses RTS/R-, TxD/R+, CTS/T- and RxD/T+ for communicating data.

## A.3.2 Ethernet Port (RJ-45)

1. Category 5 UTP cable, 8 core wire.



2. RJ45 Connector.

3. RJ45 Pin Assignment

| Pin Assignment | **568A** Definition | **568B** Definition |
|---|---|---|
| Pin1 | Green-White | Orange-White |
| Pin2 | Green | Orange |
| Pin3 | Orange-White | Green-White |
| Pin4 | Blue | Blue |
| Pin5 | Blue-White | Blue-White |
| Pin6 | Orange | Green |
| Pin7 | Brown-White | Brown-White |
| Pin8 | Brown | Brown |

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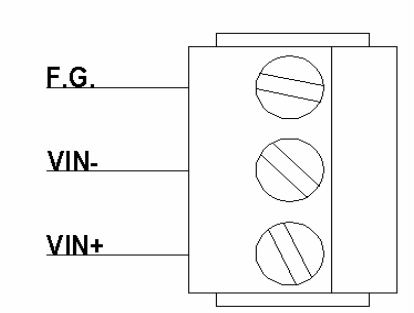
You can choose either 568A or 568B definition. If you want to make a crossover cable, you should use 568A and 568B definition respectively in each terminal of a UTP cable.

### A.3.3 Power terminal block connector




## A.4 Buzzer/LED Message

### A.4.1 Buzzer

**" ^ ":** Beep twice

**" = ":** Beep off

| Message | Description |
|---|---|
| **^===^===^===^===^===^===^...** (1sec) | Watchdog problem, return service is required |
| **^^^^^^^^^^^^^^^^^^^^^^...** | Memory problem, return service is required |
| **^==^========^^** (5sec) | Startup OK but AP firmware is disabled |
| **^==^========^^^** (5sec) | Startup OK and AP firmware is enabled |

**Table 1. Buzzer Message**

### A.4.2 LAN LED

| Message | Description |
|---|---|
| LED Off | No data is transmitting on Ethernet |
| LED blinking | Data is transmitting on Ethernet |

**Table 2. LAN LED Message**

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### A.4.3 COM Port LED

| Message | Description |
|---|---|
| LED off | No data is transmitting on COM port |
| LED on blinking state | Data is transmitting on COM port |

**Table 3. COM Port LED Message**

### A.4.4 RUN LED

| Message | Description |
|---|---|
| LED on | Jumper JP1 pin1 and pin2 are short to disable AP firmware in the flash memory. |
| LED blinking (rate: 0.5Sec) | AP firmware is running |

**Table 4. RUN LED Message**

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# Appendix B. Upgrade System Software

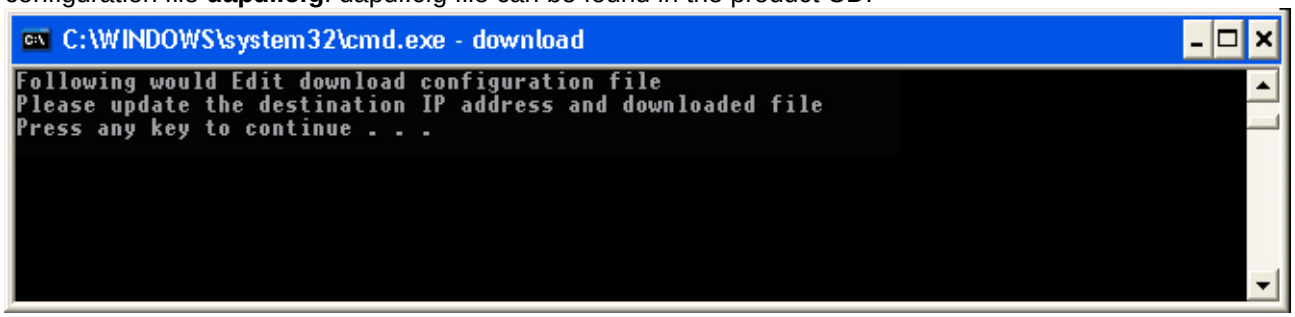
New version of firmware can be downloaded from www.aaxeon.com

## B.1 Upgrade Procedures

When you get a new software version, please follow the sequences below to upgrade your STE-601C.

1. Connect a PC (Windows 95/98/NT/2000) and STE-601C you wish to upgrade the firmware in the same TCP/IP network. Use command **ping** or **monitor.exe** utility program to verify their availability.

2. Prepare the download tool. Execute the utility program **download.bat** and press any key to edit its configuration file **dapdl.cfg**. dapdl.cfg file can be found in the product CD.


C:\WINDOWS\system32\cmd.exe - download
Following would Edit download configuration file
Please update the destination IP address and downloaded file
Press any key to continue . . .

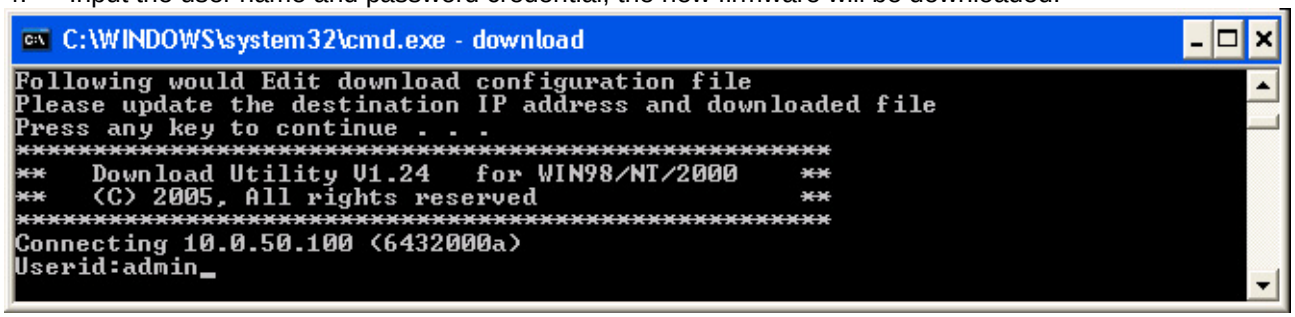
3. Edit the **"dapdl.cfg"** file to fit your system need, the content of the file looks like as the following. Be sure to save your modifications after the change is made.

   **Remote_IP 10.0.50.100**

   **Load U51cmap.hex**

   The first line identifies the IP address of STE-601C, the second line identifies the firmware (.Hex file) name to be downloaded.

4. Input the user name and password credential, the new firmware will be downloaded.


C:\WINDOWS\system32\cmd.exe - download
Following would Edit download configuration file
Please update the destination IP address and downloaded file
Press any key to continue . . .
**********
** Download Utility V1.24 for WIN98/NT/2000 **
** (C) 2005, All rights reserved **
**********
Connecting 10.0.50.100 (6432000a)
Userid:admin

5. STE-601C will automatically restart each time the firmware is successfully downloaded.

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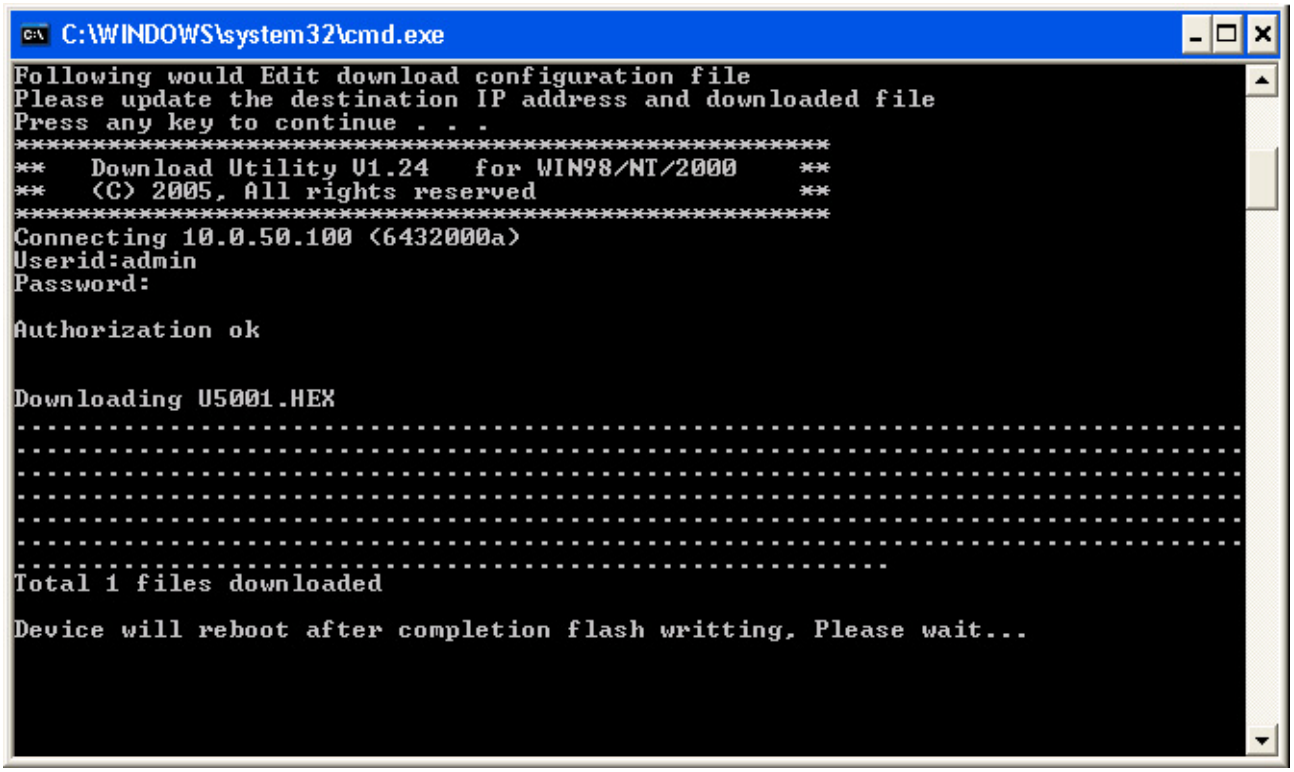
C:\WINDOWS\system32\cmd.exe
Following would Edit download configuration file
Please update the destination IP address and downloaded file
Press any key to continue . . .
**********
** Download Utility V1.24 for WIN98/NT/2000 **
** (C) 2005, All rights reserved **
**********
Connecting 10.0.50.100 (6432000a)
Userid:admin
Password:
Authorization ok
Downloading U5001.HEX
Total 1 files downloaded
Device will reboot after completion flash writting, Please wait...

## B.2 Critical Issues of Upgrading

1. You can always abort the upgrading process by pressing the **<Esc>** key from host PC during the upgrading process. STE-601C will restart automatically and the system remains intact.
2. If STE-601C does not receive any upgrading data within **30 seconds**, STE-601C will restart automatically and the system remains intact.
3. After the upgrading process finishes, STE-601C will program the flash memory and buzzer beeps 6 times then restarts. Normally, it takes around 10 seconds to complete the programming process. If an error occurs during the programming process, STE-601C will clear the corresponding memory and the system remains intact of what it was.

## B.3 Error Messagesok

Firmware upgrade may not be successful if errors occur during the process.

| Error Cause | Message | Comments |
|---|---|---|
| Illegal Hex file format | Hex File Text Error<br>Hex File Check-Sum Error<br>Hex File Format Error<br>Hex File End of Record Error | |
| STE-601C handshaking problem | STE-601C ACK Start Address Error<br>STE-601C ACK Length Error<br>STE-601C Response Command Error | |

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| | |
|---|---|
| Configuration file | Remote IP not found<br>Open configuration file failure |

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# Appendix C. Hardware Configuration

## C.1 Disable System Firmware

The AP (application program) firmware of STE-601C can be disabled. This function is used in the situation that you downloaded a wrong version of firmware that caused the system crashed.

To disable the current version of firmware and prevent it from executing, please do the followings:

1. Turn the power off, open STE-601C case.
2. Short pin1 and pin2 of jumper JP1 on the right-top corner from the main board to disable AP firmware.
3. Power on STE-601C.
4. Download the correct AP firmware to STE-601C.
5. Remove the pin 1 and pin2 of jumper JP1 to enable AP firmware.
6. Close the case and continue your operations.

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# Appendix D Configuration Utility

The configuration utility **monitor.exe** comes with the product CD or diskette is the main utility program to demonstrate and configure STE-601C's settings.

## D.1 Run the utility

Start the program under Windows 95/98/NT/2000 environment and the following window appears.

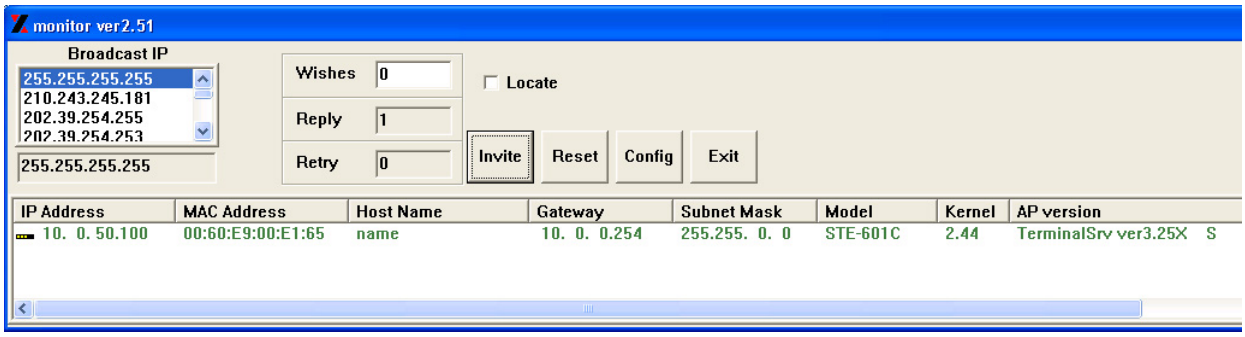


Figure D1. Main window of monitor.exe utility program

## D.2 Detect Operational Devices

You may do the following steps to detect devices currently available on the network.

1. Start **monitor.exe** utility program.
2. Select an item from the **Broadcast IP** list.
3. Specify a number in the **Wishes** box.
4. Click on the **Invite** button. This will display all the devices information you have requested.

## D.3 Configure Devices

You may use **monitor.exe** configuration utility to configure the settings of devices on the network. To do so, please follow the steps below.

1. Repeat the steps in the section of **D.2** to bring up the devices information.
2. Select the device you want to configure from the **IP Address** column, click on the **Config** button, a configuration window will popup as shown in Figure D2:

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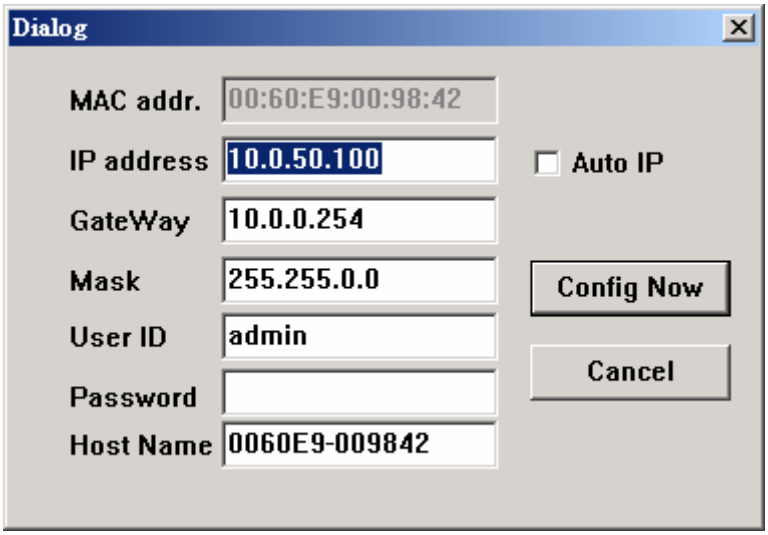


Figure D2. Configuration dialog box

3. After you click the "Configure Now" button, the target device will return an ACK message indicating the modification is successful as shown in the following:

Please note **monitor.exe** version 2.4 and above requires **gw21le.dll** library to function properly.

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The following table lists the functional descriptions for all the fields.

| Field Name | Field Descriptions |
|---|---|
| **Broadcast IP** | Except for the default IP 255.255.255.255, other items (IPs) are read from the file "seg.cfg". This field specifies a detecting IP range. It may be a designated IP or a broadcast IP. |
| **Wishes** | Specifies minimum number of the devices you wish to get reply from after sending an **Invite** request. If there is not as many as devices responding to your invitation, the system repeatedly sends invitation until your request is fulfilled. |
| **Reply** | Indicates the actual number of devices this utility program detected. |
| **Retry** | Specify the number of times that an Invite request is re-sent. |
| **Locate** | Locate the specified device. |
| **Reset** | Reset the selected device. |
| **Config** | Configure the selected device. |
| **Exit** | Exit this utility. |
| **IP Address** | Indicate the IP address of the device that replied to your request.<br>• Leading tag "!" stands for IP address collision, possibly caused by duplicated IP addresses on the network.<br>• Leading tag "?" stands for Mac address collision, possibly caused by duplicated Mac addresses on the network. |
| **MAC Address** | Indicates the MAC address of responding device. |
| **Gateway** | Indicates the IP address of the gateway. |
| **Subnet Mask** | Indicates the TCP/IP network mask. |
| **OS** | Indicates the OS version of the responding device. |
| **AP Version** | Indicates the AP version of the responding device. |
| **Model** | Indicates the model number of the responding device. This field is only available for monitor.exe version 2.0 and above. |

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